January 1958
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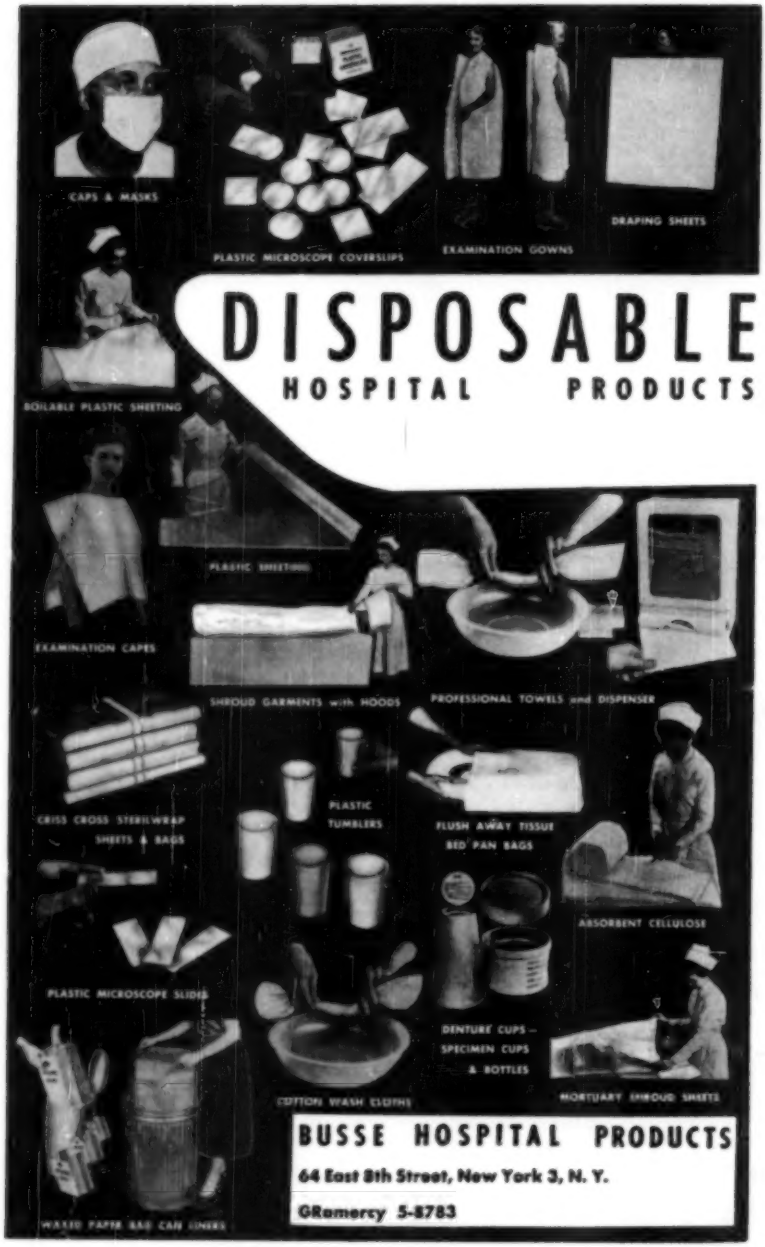
AMERICAN

Journal of Public Health

AND THE
NATION'S HEALTH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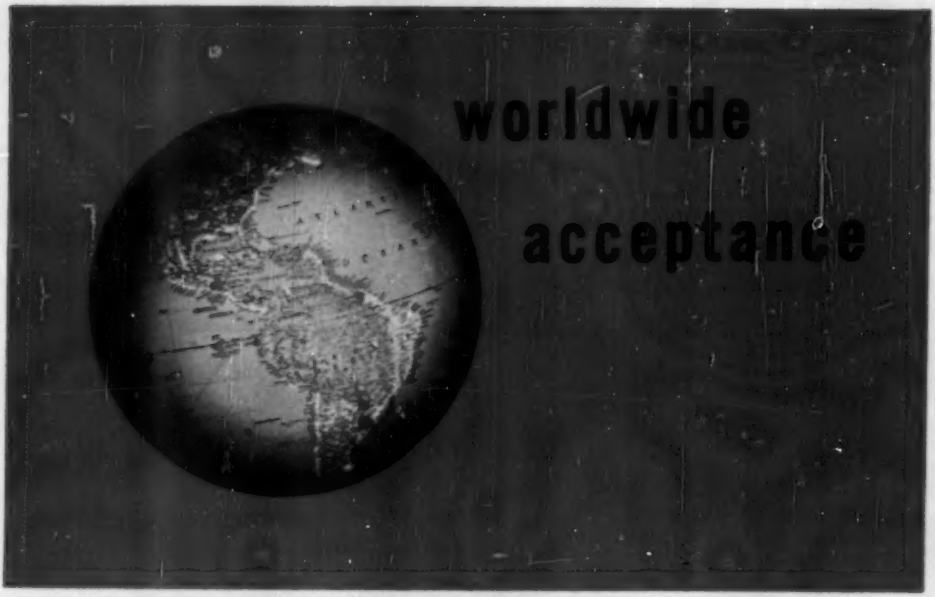

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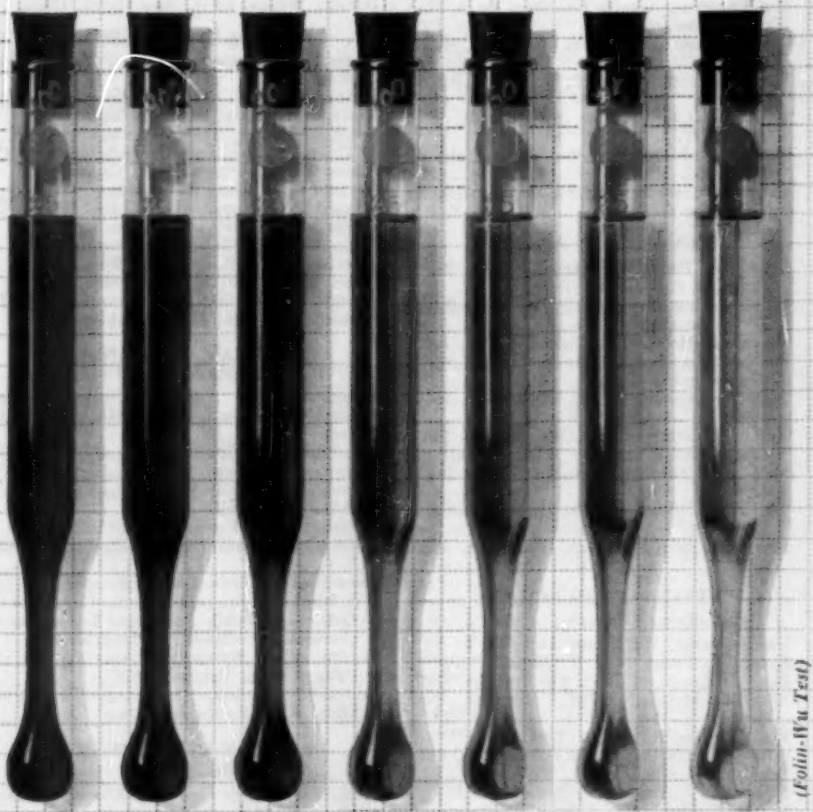

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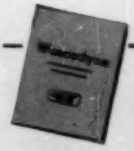

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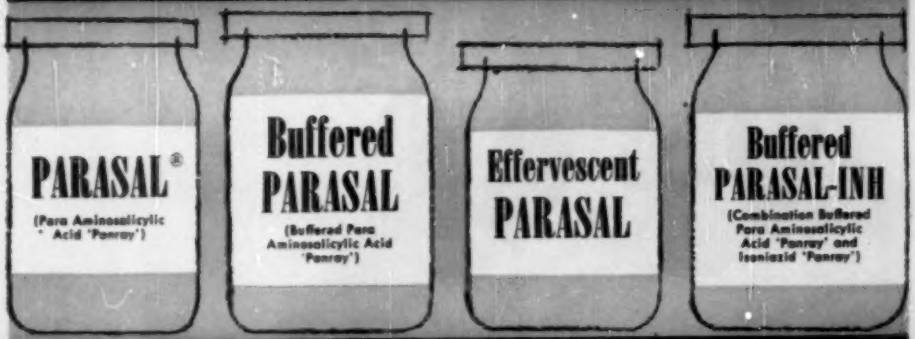

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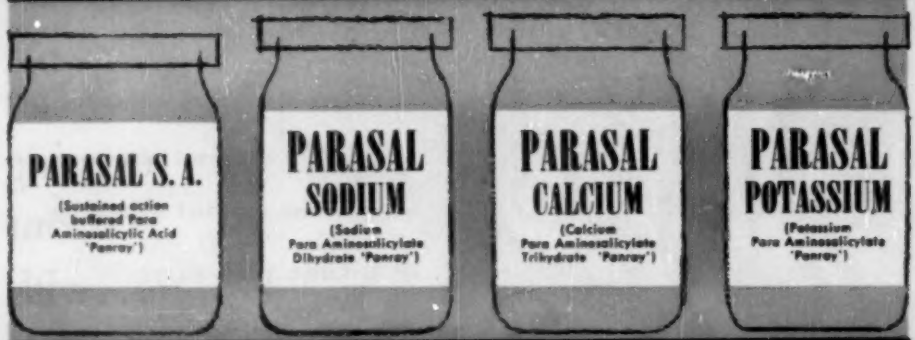

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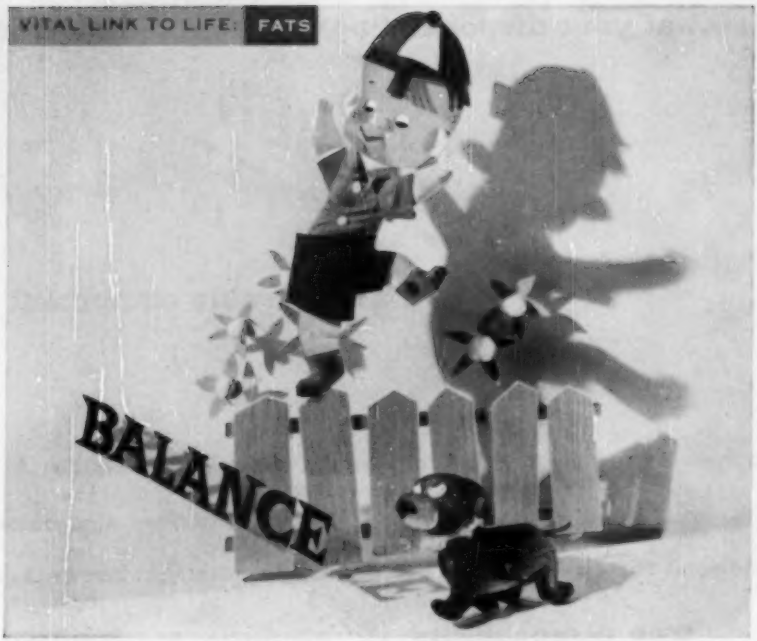

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Florida Citrus Commission, *Lakeland, Florida*

1. J. Agr. & Food Chem. 4:418, 1956.

2. A.M.A., Council on Foods & Nutrition: J.A.M.A. 146:35, 1951.

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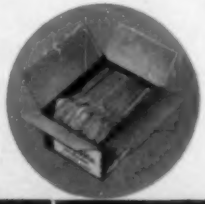

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1. Thomas, K.W.: J.A.M.A. 167:1636 (Dec. 22) 1956.

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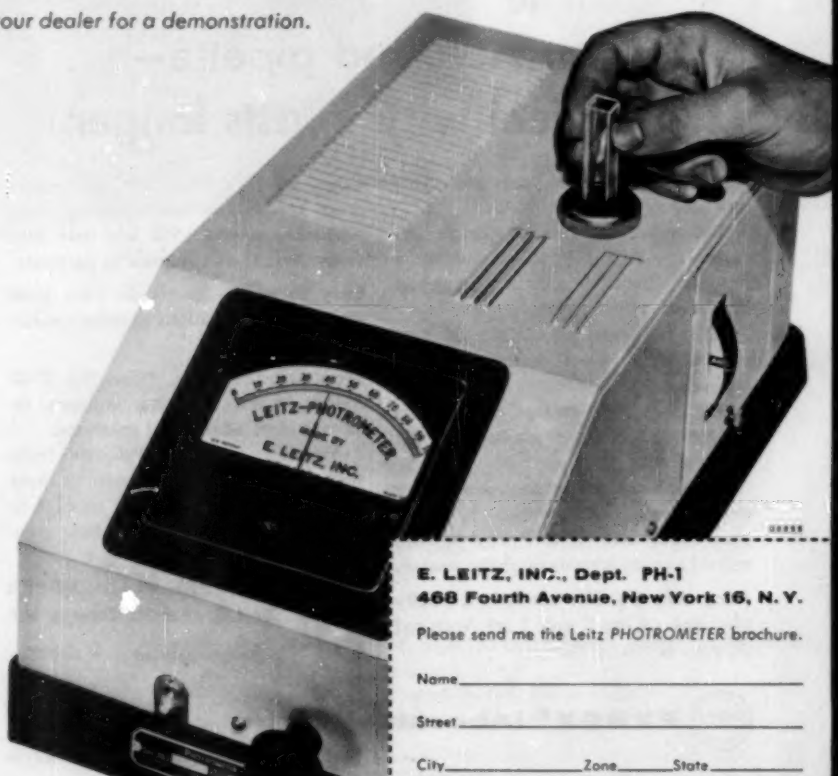

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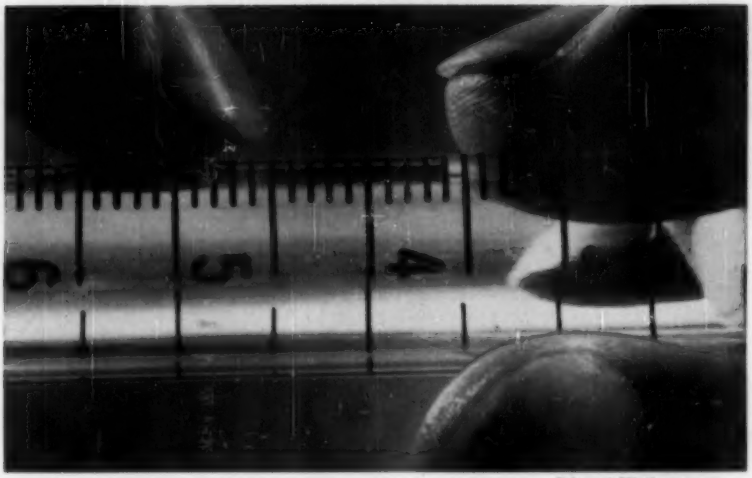

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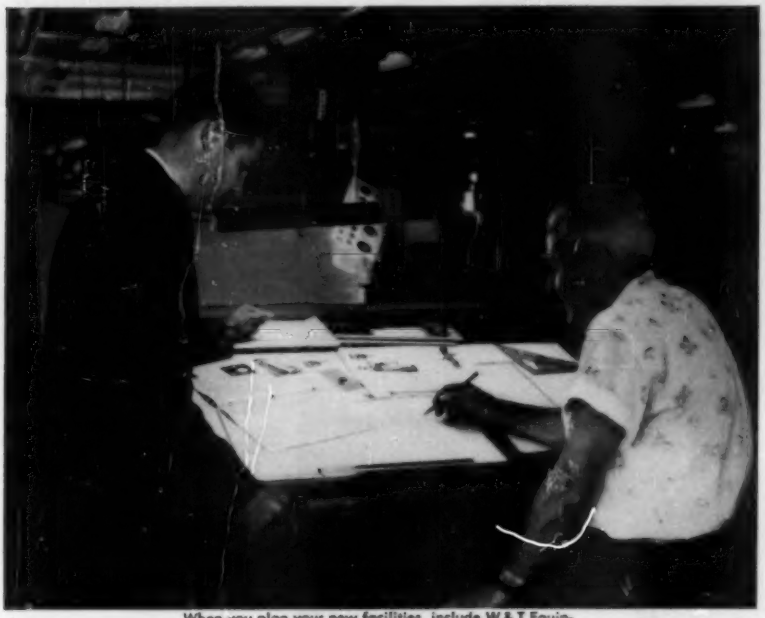
(1) Bibby, B. G. Effect of Sugar Content of Foodstuffs on their Caries-Producing Potentialities. J. Am. Dent. A., *51*:293 (Sept.) 1955.

(2) Ludwig, T. G., and Bibby, B. G. Acid Production from Different Carbohydrate Foods in Plaque and Saliva: Further Observations Upon the Caries-Producing Potentialities of Various Foodstuffs. J. Dent. Research, *36*:56 (Feb.) 1957.



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Journal of Public Health

One of the most compelling instances of personal change and development in adult life is the growth of a "professional personality" in young adults. This process and its consequences is particularly important for a multidisciplinary profession such as public health. Dr. Reed raises a number of pertinent points in this Delta Omega lecture and it is to be hoped that his remarks will provoke others into further study of this important problem.

SOME ASPECTS OF MULTIDISCIPLINARY PROFESSIONS

Lowell J. Reed, Ph.D., F.A.P.H.A.

WHEN DR. ATWATER asked me to give the Delta Omega Lecture, suggesting that I might talk on the professional aspects of public health, I accepted his invitation with the thought that this might force me to clarify vague ideas concerning the health professions that had been floating around in my mind for several years. I am afraid that as I proceed you will find that there is still considerable free-floating in the ideas I have to present.

Coming into the field of health as I did from mathematics, I came into contact for the first time with a group of doctors who had a strong consciousness that they were professional men and who took great pride in their profession. This puzzled me, for although mathematicians consider their field of activity a profession and have professional societies, they pay little attention to the profession of mathematics as such. Their professional societies are concerned with mathematics and not with mathematicians. It did not take long for me to realize that the reason for this lay in the fact that the medical profession was legally circumscribed. A doctor is not entitled to practice medicine until he has passed certain qualifying examinations that are established in law.

This difference arises from the fact that, while mathematicians practice with

pencil on paper or with a rapid calculator, the doctor of medicine practices with drugs and instruments on human beings. This necessitates some state control as to who shall be entitled to engage in such practice, while no such control is necessary as to who shall practice mathematics. This means, of course, that it is possible at any time to determine by law who is a practicing medical man, while on the other hand anyone is permitted to practice mathematics and accept pay for his services provided he can find a customer. The medical group thus becomes a closed fraternity and its members have to devote a certain amount of attention to membership matters, which naturally engenders stronger professional feelings and ideas than would otherwise be the case.

It is amusing to note that in the early days of Greek culture there was a similar situation among mathematicians. In fact, the famous geometric theorem, Pons Asinorum, which states that in a right triangle, the square on the hypotenuse is equal to the sum of the squares on the legs, is said to have been so revered by the Pythagorean School that its proof was held secret and was revealed only to a duly accepted member of the "lodge." Whether this story is true or not, the field of mathematics has been an open one for centuries.

I have contrasted medicine and mathematics for, although both require a long period of study to develop proficiency, their practitioners, due to various causes, diverge widely in their social behavior as professions. As we turn more definitely to public health, we find ourselves involved with disciplines that exhibit all gradations between these two fields.

Before proceeding to a consideration of the professions involved in public health, a few general points should be clarified. We should not confuse the members of any profession with the members of its professional society. In medicine, for instance, we have many practicing physicians who are not members of medical societies and there are members of the societies who are not legally entitled to practice medicine. We must also be careful not to limit members of public health professions to those individuals who are working in tax-supported positions. For example, among the members of the APHA there are many persons working within their branch of the health professions under the support of private enterprise. We cannot therefore look to the legal regulations dealing with qualifications for tax-supported positions as a means of identifying or defining the members of our professions. These are important distinctions, for they imply that membership in a public health profession cannot be determined by society membership or by the legal definitions of public health positions.

Among public health professions, one that has many features in common with medicine is that of nursing. This is natural because nurses work closely in relationship to doctors and their activities also directly affect human beings. But while there are certain regulations with regard to registered nurses, these have never been as tightly drawn as in the case of medical men, for it is possible to hire a nurse who is not a registered nurse. Nursing organizations have pressed toward tightening legal restrictions. I believe such attempts to restrict membership in any professional group are unwise except as such legal restrictions arise from the needs of the people whom the profession serves.

There are a wide variety of other professional groups engaged in public health: sanitary engineers, dentists, veterinarians, microbiologists, chemists, statisticians, epidemiologists, and several of the medical specialties. The membership in some of these is so great that they, like medical men and nurses,

organize public health branches of their own professional societies. Thus many of the members of the APHA are members of their general professional society, of a public health branch of their profession, and the Section of the APHA dealing with their professional interests. There are, however, many professional people engaged in activities that are actually a part of public health who are not members of any of these organizations. It is often difficult to identify such workers as public health people and we are apt to limit our consideration to those individuals who maintain membership in the professional society, organization, or section that has the label "public health" attached to it. This has unfortunate aspects, for if we are not to become ingrown it is important to keep this hidden group of workers under consideration in filling public health positions. We need constantly to draw new blood into our field, and yet it is difficult to do so when many of the promising people in a given profession do not bear the public health label. It would be desirable to seek some method by which professional people not now classified as in public health might by self-definition label themselves as public health bacteriologists, chemists, engineers, statisticians, and so forth.

All of this sums up to the fact that it is exceedingly difficult to identify those individuals in a specific discipline, other than medicine, who, in pursuing their profession, are working in public health directly or indirectly.

This has very profound effects. Some of them are intangible but others are very practical, for they affect the relative positions of the professions within the public health field. Members of certain professional groups become dissatisfied because they find themselves left out of policy planning and their compensation at a level that they believe inappropriate.

How can this situation be corrected so as to give each of the professions within the field its proper recognition? Is it to get tighter legal regulations or to extend the specialty board idea? I do not believe so.

As I have considered this question, I have naturally turned to my own specialty, that of public health statistics, because I am most familiar with its evolution and current role. When I first became acquainted with this field the vital statistician, except in rare situations, was little more than a statistical clerk. Opportunities were so limited that 35 years ago I hesitated to take a person for training in statistics at the doctoral level because there was no market for a person with this training. This is far from the case today, for there are many positions where the statistician has an opportunity to put his professional training to work at the policy level and to receive appropriate compensation for such services. Well trained statisticians are now in great demand. How has this change come about? Not by organizing professionally for the purpose of upgrading the position of statistician, but by statisticians using their professional gatherings to develop their subject matter and its role of service to public health.

It is my opinion that this can be done within any professional group of a multidisciplinary field like public health and, in fact, I believe that it is the only appropriate way to approach the question.

I have managed to talk for several minutes on "professions" and have dodged a definition of the term. Subconsciously each of us has been using his own definition. It might now be desirable to examine the word. Since the noun "profession" stems from the verb "to profess" meaning "to announce belief in," some part of that meaning remains in our concepts even though the word has been greatly broadened by usage. Indeed, the word "profes-

sion" is often used as synonymous with any occupation demanding special skill and in this sense has little of the idea of avowal or declaration of belief. Still, deeply imbedded in our minds is the old concept of service to mankind that was embraced in the phrase "the learned professions" as applied to medicine, law, and divinity. For us in public health I feel that these ideas of belief in public health as an important service to mankind should be kept constantly in mind lest our profession sink into professionalism.

Well, you can see why I said that my ideas on this subject were still largely free-floating. However, by this mental excursion I have arrived at a few beliefs that I can state fairly succinctly.

First, it is important for any professional group not to attempt to draw its lines too tightly by defining precisely who constitutes a member of the group, for this tends to stop vigorous growth.

Second, legal restrictions as to membership in a group should be used sparingly, for those that today seem progressive, a decade later are handicapping. Laws that provide methods for upholding quality in a profession are to be preferred to those that attempt to specify what constitutes quality.

Third, a professional society should devote its energies to developing its subject matter and to studying the ways in which this knowledge can be used for the benefit of public health.

Fourth, I feel that as professional men and women we should take pride in the original verb "to profess" and in the spirit of that word say, "I believe in public health."

Dr. Reed is president emeritus, Johns Hopkins University, Baltimore, Md.

This Delta Omega Lecture was presented before the First General Session of the American Public Health Association at the Eighty-Fifth Annual Meeting in Cleveland, Ohio, November 12, 1957.

Food for Thought

"These Americans are the most peculiar people in the world. You'll not believe it when I tell you how they behave. In a local community in their country, a citizen may conceive of some need which is not being met. What does he do? He goes across the street and discusses it with his neighbor. Then what happens? A committee comes into existence, and then the committee begins functioning on behalf of that need, and you won't believe this but it's true. All of this is done without reference to any bureaucrat. All of this is done by the private citizens on their own initiative. . . . The health of a democratic society may be measured by the quality of functions performed by private citizens."—ALEXIS DE TOCQUEVILLE

The impact of nuclear energy increases daily. The full impact of this form of energy will not be felt for decades. However, a number of progressive health workers have begun to develop the legal and administrative machinery required for a broadly based program to control radiation hazards. This article presents the problem, states the basic principles for dealing with it, and indicates some courses of action undertaken in Pennsylvania.

RADIATION—A MAJOR PUBLIC HEALTH PROBLEM

Berwyn F. Mattison, M.D., F.A.P.H.A.

RARELY DOES a major new public health hazard loom on the horizon unexpectedly. At the beginning of this century such a situation occurred with the development of the automobile, and now we have radiation. While cosmic radiation has been bombarding mankind since the world began and x-rays have been in use now for over half a century, massive exposure to radiation did not occur until the development of atomic energy for industrial and military purposes. Speaking before the World Health Organization Forum last year, Dr. John C. Bugher said: "The atomic energy industry is a mere fledgling that virtually has emerged only during the past decade. Notwithstanding the youth of this era, human society is even now involved in changes of such magnitude that only the historians of the next century will be able adequately to describe the full impact of this completely new form of energy."

Does this new and burgeoning industry together with preexisting forms of radiation and the ever-present threat of atomic fallout create a public health problem? The United Nations Scientific Committee on the Effects of Atomic Radiation believes so. Recently, they stated: "This committee considers that one of its most urgent tasks is to collect as much information as possible on the amount of radiation to which man is exposed today, and on the effects of this radiation. Since it has become evident that radiation due to diagnostic radiology and to radiotherapy constitutes a substantial proportion of the total radiation received by the human race, the committee considers it desirable to draw attention to information that has been obtained on this subject."

Other professional groups in public health have shown similar concern about the problem. The American Public Health Association has a Committee on Radiologic Health which has been working for the past two years to produce model state legislation on radiation control; minimum training standards for various disciplines given responsibility in this field; and an authoritative statement for the public on community-wide health hazards related to radiation. Last year the Association of State and Territorial Health Officers

also appointed a Radiologic Health Committee whose membership overlaps with that of the APHA Task Force, which is a subcommittee of the Standing Committee on Special Health and Medical Services. At its 1956 meeting the American College of Preventive Medicine featured a speaker on "Preventing Injury from Radiation," thereby indicating their interest in and concern with this same problem.

As a physician I find the possibility of widespread human injury by radiation particularly disturbing, for we do not yet have effective means of combating radiation illness once it is established. The damage produced by radiation like that resulting from other physical agents is usually irreversible. This does not mean that patients with slight or moderate radiation damage are doomed, for the regenerative power of the human body is tremendous and much of the damage may be located in tissues that are constantly being replaced, such as the blood. The fact remains, however, that for the cells damaged or destroyed by radiation, there can be no recovery. This makes radiation hazards particularly significant.

It is encouraging to know that the Public Health Service has expanded its activities on radiologic health. Dr. Clinton C. Powell, who is developing the service program on medical aspects of radiation, has pointed out that genetic effects, increased incidence of neoplasms, including leukemia and premature aging, must be considered in establishing standards for radiation exposure. Our knowledge of the acute effects of massive doses of radiation is quite definite and almost complete. But there are still many gaps to be filled, concerning low-level, but long-continued exposures to radiation from various sources which may be occurring day in and day out, particularly among people actually operating radiation machines or handling radioactive materials.

This cannot be taken to mean that all use of radiation is "bad." It has been a great boon in various instances to industrial processes; it has helped diagnostic medicine tremendously; and, of course, it can well be a lifesaving weapon in certain types of malignant diseases where the differential rate of damage to malignant cells far exceeds that to normal cells.

As an example of the complexity and ubiquitous extent of radiologic health problems, we might mention the experiments in the use of radiation to preserve foods and the surveys on radioactivity now being carried out by the Food and Drug Administration on selected food products. Natural radioactivity in ground vegetables, for instance, varies tremendously depending on the characteristic radioactivity of the geologic formation in the region producing the vegetables. To this is added the problem of radioactive fallout on soil and leafy vegetables which in some degree must be anticipated in the future. The survey being carried out by the Food and Drug Administration covers 12 staple foods, including potatoes, wheat, corn, dried fruit, liquid milk, bread, and canned tomatoes.

Against this background, let us now go back and again ask the question: "Is radiation a major public health problem?" We have seen that a number of health agencies believe that it is. But what criteria must we apply to make this determination? First, the extent of the problem merits public consideration. There is not one among us who will not, throughout his lifetime, be affected by cosmic radiation, and most of us at some time will be affected by one or more of the following—radiation received in a physician's office or a dentist's office, radiation received while working in certain industries, radiation received through ingestion of foods and, of course, the new hazard, its extent not yet clear, radiation from fallout

produced by testing of nuclear weapons.

Second, is this a problem which can be handled adequately by each individual? Obviously it is not, and some concerted community-wide action will be required if radiation hazards are to be adequately controlled.

Third, are the hazardous conditions produced through radiation correctible to any significant degree? Here our knowledge is much more recent, but it certainly has been well established by the Atomic Energy Commission that a great deal of work with massive sources of radiation can be done safely, providing meticulous care is exercised in utilizing protective devices. Furthermore, our brief experience in Pennsylvania has shown that inspection of sources of radiation in daily use across the Commonwealth can repeatedly uncover needless (and frequently unrecognized) sources of stray radiation which are correctible on a practical and economical basis.

Using these three criteria, alone, I believe that the place of radiologic health as a major public health problem has been demonstrated.

Others can give you more detailed accounts of radiation hazards in industry, in the healing arts, and through the eyes of health department people actually doing control work. I shall not poach on their preserves, but I do wish to discuss the general areas of competence which public health brings to the control of radiologic hazards. One of our first concerns in approaching this problem in Pennsylvania was whether the traditional public health disciplines were sufficient to meet this new problem or whether new approaches had to be found in order to exercise satisfactory control. As we worked with radiologic health problems during the past two years it has seemed that we have simply been applying the four general technics which again and again have proved successful in public health work.

For instance, just as physical barriers were raised against disease in the past through filtration of water and pasteurization of milk, so we now raise a physical barrier between this "pathogen" and our susceptible population. Adequate shielding in many instances is the literal physical barrier which can prevent repeated radiation insult to human tissues. It is a prime stock in trade for our control program.

So far, there is no way of raising the physiologic resistance of individuals or groups who may be exposed to radiation hazards. There is no vaccine, there is no vitamin, there is no magic drug which will create an immunity against the damage usually produced by a given radiation dosage. Even here, however, we can and do consider levels of physiologic resistance; in some industries and professional groups exposed to radiation certain indexes (such as blood counts) are watched and when evidence of decreased resistance appears further exposure is discontinued immediately.

The epidemiologic approach to many of our problems both in communicable disease and chronic disease has been one of the standard tools of public health. Acquiring knowledge of the pattern of disease occurrence in a community, demonstrating the method by which a pathogen exerts its influence on an individual or group, and breaking the epidemic cycle through isolation or quarantine of the individual have all been traditional activities of public health workers. To some extent they have already been applied again to radiologic hazards. We know, for instance, that growing tissues are more susceptible to radiation damage than less rapidly changing tissues; we know that the germ plasm and the fetus are liable to irreversible damage if sufficiently irradiated; we know that certain levels of radiation exposure produce tissue changes simulating the aging process. We also recognize that there may be

animal as well as vegetable vectors in the transmission of radioactive material. It appears, for instance, that there is a concentration of radioactive particles in the thyroid of small animals feeding on leafy plants which have been subjected to radioactive fallout. An attempt is being made, incidentally, to establish a base line of radioactivity in small animals near our first atomic energy power plant in Pennsylvania with the hope that we may later determine whether the level will change after the plant is in operation. All this epidemiologic information will be accumulated, and with further experience it will in large measure determine the future direction of our control efforts.

Our fourth standard tool in public health practice, the educational barriers which can occasionally be raised against disease, has certainly been most useful in alerting people to the new hazard produced by atomic radiation. In industry and in the professions where people work more and more frequently with radioactive material an intensive job of education must be carried out to protect both the workers and others. Furthermore, the public itself has a vast and growing concern about the problem of radiologic health. As the years go by, we must keep the people as well informed about ways in which they can avoid unnecessary radiation damage as we have in the past concerning the avoidance of accidents, diphtheria, or typhoid fever.

Finally, public health has a responsibility for control, by law or by regulation, of the acts of individuals or groups which might be injurious to other individuals or groups. Such has been the effect of our Regulation 433 in Pennsylvania. Here, again, only official agencies working under constitutional law can provide the broadly based control program needed to offer the assurance of maximum safety for most people in the face of this expanding hazard. Just as the control of stream pollution through untreated human sewage or through acid mine wastes begins to yield to control measures only after adequate legislation and regulations are available, so the pollution of our streams with radioactive wastes, the pollution of the air with radioactive gas, and the unnecessary exposure of people to other sources of radiation had to await official governmental action. Industry has cooperated well as have the professions with whom we have worked so far. But individually, neither industry nor the professions can control the tremendous powers which have been unleashed, and which to one degree or another threaten all of us. It will take the best efforts of health agencies, official and nonofficial, of industry, of the healing professions, of educational institutions to assure future generations that the many boons made available to them through nuclear energy shall not be overbalanced by the harmful effects of those same forces.

Dr. Mattison, formerly secretary of health, Commonwealth of Pennsylvania, Harrisburg, is now executive secretary, American Public Health Association, New York, N. Y.

This paper was presented at the Sixth Annual Pennsylvania Health Conference, University Park, Pa., August 21, 1957.

As public health explores the future, it tends to discover forgotten groups with special health problems. The mentally retarded belong to one of these. Forward movement into new areas of community concern requires mechanisms for social action, and it is only recently that these have begun to be provided for the mentally retarded. This is best evidenced by the programs for mentally retarded children. The nature of these programs, their goals, and their problems are discussed in this paper.

NEW PROGRAM FOR MENTALLY RETARDED CHILDREN

Arthur J. Lesser, M.D., F.A.P.H.A.

THE EMERGENCE during the past year of clinical programs for mentally retarded children as a major activity of about one-half of the state health departments is a remarkable new development in maternal and child health. Until recently the mentally retarded child was indeed the forgotten child, of interest only to a few specialists. Now there is a widespread interest in him and a better appreciation of what mental retardation is. How has this come about? What are some of the current concepts of mental retardation? What do these new programs consist of and what are they trying to accomplish?

The primary moving force behind these developments is the parents of retarded children. After the war the development of parents groups increased rapidly and in 1950 the National Association for Retarded Children was formed. This organization, which now has about 45,000 members, has as its principal objectives developing of community programs for the care, treatment, and training of the retarded; promoting better understanding of the problem among professional groups, the general public, and legislative bodies; and stimulating research and professional training.

The association's proposals for federal legislation in 1955 found a responsiveness in the Department of Health, Education, and Welfare and the Congress which has made possible a broad program for mentally retarded children and adults. This is outlined in the department's publication, "A Balanced Approach Toward Meeting the Needs of the Mentally Retarded," which includes the research program of the National Institutes of Health into causes, prevention, and treatment; the grants for research in teaching methods of the Office of Education; the rehabilitation program of the Office of Vocational Rehabilitation; and the Children's Bureau program for the development of community health and child welfare services for mentally retarded children.

To assist state health departments in developing community programs for re-

tarded children, the Congress in 1957 appropriated $16,000,000 for grants for maternal and child health, an increase of $4,000,000 over the previous year. Of this sum, $1,000,000 was earmarked for special projects for mentally retarded children and the Appropriations Committee Report expressed the hope that an additional million dollars would also be used. During the past fiscal year this has made possible a rapid nation-wide development of these programs, a process which actually began the year before when grants of maternal and child health funds were made to four states for this purpose.

At present, 28 states are receiving these special project grants and plans for three more are in the process of approval. The grants for these 31 projects total $1,338,530 for the current fiscal year. Five other states are financing programs dealing with mental retardation by means of regularly apportioned federal maternal and child health funds and state and local matching funds. Preliminary reports suggest that during the current fiscal year the states will use about $500,000 of federal maternal and child health funds in addition to the special project grants, thereby bringing the total pretty close to the $2,000,000 the Congress hoped would be used.

In general, state health departments are using these grants to establish demonstration programs centering about problems of health supervision and the growth and development of retarded children. The services include early case finding, diagnosis, evaluation of a child's capacity for growth, and working out with the parents an individual plan for continuing care and supervision.

These programs are particularly concerned with preschool children who are going to live at home or in a foster family home rather than an institution. If the parents are to be able to care adequately for their children at home, as most of them want to do as long as possible, they need much help from the staff of such community programs. The importance of this help is emphasized by the fact that less than 10 per cent of the retarded are in institutions; the large majority are at home. Merely establishing a diagnosis, therefore, is of little value unless the means are available to help the parents to carry out the plan of care.

The forms that these programs take are based on fundamental facts and concepts about mental retardation. Mental retardation is hardly a diagnostic entity, since it has many causes and manifests itself with wide variations. While all mentally retarded individuals have in common the characteristic of subnormal intelligence, the degree of abnormality varies from an intellect too low to measure to borderline normal. Yet even this kind of definition must be qualified, since a large proportion of children seen by the mental retardation and child guidance clinics have normal intelligence and yet are functioning at retarded levels. Also, the borderline of normal intelligence as measured by the IQ test is arbitrarily drawn and has the effect of dividing children who have the intellectual ability to progress in school from those who cannot. On this basis, it usually estimated that 3 per cent of our total population is mentally retarded.

Intelligence studies by age groups show that there are considerable variations within this average figure of 3 per cent. The prevalence studies made in Onondaga County by the New York State Department of Mental Hygiene [1] indicate suspected rates of six per 1,000 for three- or four-year-olds; 22 per 1,000 at five years of age; nearly 40 per 1,000 for six-year-olds, and 80 per 1,000 in the 10–15-year age group, with subsequent decline for older age groups. Other studies indicate that the prevalence of retardation in the adult popula-

tion is considerably less than 3 per cent. The increase in prevalence of retardation is so closely associated with the school years that the term "schologenic" retardation has been applied to the condition.[2]

This suggests that a great part of the problem of retardation is directly related to the introduction of children to formal education, a process involving abstract intellectual ability. Many retarded children, who do poorly in school, upon becoming adults are able to merge into the total adult population. They can perform jobs which do not have exacting intellectual requirements and they can function like other workers around them. This is true, however, only of mildly retarded individuals who, fortunately, constitute the majority of the group. Probably 75 per cent of the mentally retarded have an IQ ranging from 50 to 75. Experience shows that with help this group can become a part of the community. The children in this group usually appear normal at birth. During the preschool years they show only slight deviations in developmental patterns. As a rule, their retardation becomes most obvious during the first year or two at school. They generally do well in special classes. The mildly retarded are usually recognized early in school life as they are confronted with the demands of the process of "normal" education.

The more severely retarded, those with an IQ of less than 50, can frequently be recognized in early life by clinical signs associated with mental retardation. Marked deviation from normal developmental patterns is noted earlier in life. Parents today have considerable awareness of the more prominent aspects of development during the first two or three years of life. When a child is slow in developing or is obviously retarded it is to the family doctor or pediatrician that the parents come, to find out what is wrong and what they can do about it. This is a difficult time for the whole family and it requires the best judgment and understanding on the part of the physician and others in handling the situation. While the slowness in development in a mildly retarded child usually is not severe enough to cause parents to bring the child to a doctor before five or six years of age, the more severely retarded can be identified early, frequently in infancy and sometimes at birth.

Establishing the diagnosis is a medical responsibility in the course of which assistance is obtained from other disciplines. The differential diagnosis involves consideration of conditions which sometimes create the effect of mental retardation even though intelligence is normal, such as severe hearing impairment, aphasia, cerebral palsy, and emotional disturbances. The examination may also disclose the existence of physically handicapping conditions, which not infrequently accompany mental retardation. While disorders of metabolism cause mental retardation in only a small proportion of children, the opportunity to prevent mental retardation by the early recognition and treatment of phenylketonuria and galactosemia in infancy can be realized only by the recognition of such conditions. The degree of retardation and the potential ability to the extent that they can be determined, as well as social and psychologic factors and family relationships are all involved in arriving at the diagnosis and making recommendations to the parents.

The manner in which clinical findings are interpreted and advice is given is critical for the future of the child and the family. This is quite different from the management of an acute illness where parents usually have little difficulty in understanding the physician's explanation of the illness and are able to follow his advice and instructions. The confidence they place in their physician is enhanced where specific treat-

ment measures are available and recovery can be expected shortly.

Physicians generally have had much less experience in discussing with parents the problems created by having a mentally retarded child. Even in the few special clinics for retarded children where the staff has become skilled and experienced parents may have much difficulty in comprehending facts presented simply and forthrightly. Yannet [3] gives a striking example of this in telling of a chance encounter with a woman in a restaurant who overhearing his conversation commented that she had had a mentally retarded child who had died. She had been to many doctors but never did find out what was wrong with her child. She had been to the clinic in New Haven but "I didn't understand one word the man was telling me." The man referred to was, of course, Dr. Yannet. On looking up the record subsequently he found the child had been completely worked up with a clear diagnosis and prognosis. There had been a number of interviews with the mother; yet she had not understood and the staff had not realized it. Such lack of comprehension may be due to the way the information is presented—a difficulty in communication. Frequently, it is a subconscious or outright rejection of the diagnosis and an inability to deal with the problem. The factors leading to this rejection need to be recognized because these parents are in great need of help. These are the parents who shop around fruitlessly seeking a diagnosis and prognosis they want to hear rather than the realistic and objective appraisal they find so hard to face. Sometimes this behavior delays for years making a plan for the child's care; indeed, it may even retard his development and create complicating emotional problems.

It is frequently pointed out that parents need to learn to accept the child for what he is. This is much easier said than done. Intellectual ability is so important in our culture that having a seriously defective child is considered one of the most tragic things that can happen. While most parents do learn to cope with the situation, it is doubtful that many can accept it and develop the same kind of relationship to the child as they would if he were normal. In stressing the importance of accepting the child are we creating a further difficulty by expecting parents to achieve what may be impossible?

The ability of parents to respond constructively to planning for the care of their child is greatly influenced by the kinds of recommendations that are made to them. A basis for serious emotional conflict is often created by suggesting early placement in an institution, either directly from the hospital at birth or in early childhood if the diagnosis is made then. Most parents reject or resist such a suggestion. There is neither science nor logic in advising routinely that mongoloid children, for example, or children with an IQ less than 50 should be placed in an institution. Most retarded children need a close relationship with their mothers in infancy and childhood for the same reasons that normal children do. Each child must be evaluated as an individual and recommendations for care must be responsive to the parents' desire and ability to provide him with the love and security he needs. The facts need to be presented to the parents who should have the opportunity to decide for themselves whether to institutionalize the child or try to care for him at home as long as they can.

Of immediate concern to every parent of a retarded child is the level of achievement he can be expected to attain. Much depends upon the availability of community resources, such as special classes, counseling services for the parents, and the kinds of relationship the child develops with his parents and others. It is important to keep in mind the difference between intelligence and social maturity.

Hormuth [4] illustrates this by the example of two boys of the same age and the same IQ. One is able to dress himself, feed himself, and go to the store. The other is so dependent and immature that he can do none of these things and will not leave his mother's side.

If parents are to give a retarded child the care he needs to achieve the level of social and intellectual development that represents his capabilities, they are going to need a good deal of help. It is of little value for a clinic to ascertain the nature and degree of retardation in a child and send the parents home with this information only. The diagnosis is only the first step in planning for his care. State health departments are now attempting to develop through demonstration programs the services needed by mentally retarded children and their parents. These are being organized within the framework of the maternal and child health program. The basic interests of the MCH program—early case finding, preventive health services, child health supervision, mother-child and family relationships and growth and development—are also the basic interests of a program for mentally retarded children. To what extent prenatal factors are involved in causing mental retardation remains to be seen, but certainly good maternity care reduces the incidence of mental retardation that may result from such conditions as kernicterus, birth injuries, anoxia, syphilis, and endemic goiter.

The nucleus of the demonstration programs is the mental retardation clinic. The staff includes a pediatrician who is usually the medical director, a psychologist, one or more social caseworkers, a pediatric nurse, and in some clinics a child development specialist, and a speech therapist. Psychiatric and other medical consultants are provided, as are the usual consultant services of state health departments, such as nutrition service. With the diagnosis completed, a more or less continuous relationship must be maintained with the family if counseling and social casework services are provided. When the family lives at a distance from the clinic where the clinical team functions, and cannot attend regularly, such follow-up services are much more difficult to obtain. Several of the states are attempting to find out through these demonstration projects how to provide counseling and casework services for families in small towns and rural communities.

What is proving most meaningful to the parents is the help they receive in home training and everyday living with their retarded child. This is described in practical terms by Dittmann [5] who states that at the evaluation conference short-term goals may be set such as learning self-feeding or learning to put on his shoes, or toilet training. As one goal is reached, the next one is planned. The processes involved in guiding many children to achieve degrees of self-help are basically the same as in normal children. With an understanding of the child's potentiality for achievement and of the specific goals to be reached, the public health nurse is in a key position to assist the family in helping the child in reaching his goals. She is, however, dependent upon the mental retardation clinic for the evaluation of the child and his family. She needs to maintain a continuing relationship with the clinic staff in working with mentally retarded children in their homes in order to give understanding support to their parents and to participate in the training programs that are directed to the total plan of care for each child.

It should be recognized that in most instances this will require more intensive and frequent visiting in the home than is customary in the health supervision of well children. Most of these programs are offering public health nurses inservice training in mental retardation and in growth and develop-

ment, and are providing consultation by pediatric nurses.

Many young retarded children will benefit from day group care or so-called nursery classes.[6] Many local parents' groups are assuming the responsibility for financing and organizing such opportunities for group experiences. Under appropriate supervision the younger and the more seriously retarded children are able to make progress in social relationships. To benefit from such group experience it is generally necessary for a child to be able to function at a level of about two and a half years. Not to be underestimated also is the great advantage to the mother in being relieved of the care of the child for several hours during the day.

As the retarded child gets older it may be necessary to make other plans for him. Problems may arise in relation to adolescent siblings. As the parents become older, they may find his care increasingly burdensome. Or the retarded child may develop behavior and emotional problems which become more difficult to manage as he grows up. Some become increasingly lonely. Reasons such as these may lead to the decision to place him in an institution.

The development of community programs for the retarded and the increase in special classes has renewed interest in the role of the institution. Tarjan[7] considers it the institution's function to care for those children who cannot be cared for elsewhere. In general, these are the most severely retarded who cannot develop a relationship with anyone and are completely dependent, those more moderately retarded who cannot be cared for at home because of antisocial behavior, and retarded adults who are dependent and no longer have anyone to care for them. Others would include some children whose home conditions make their care impractical and moderately retarded adolescents who can receive vocational training at an institution but not in their own communities.

In the brief experiences that health departments have had to date in mental retardation programs several major problems have been receiving particular consideration. One already referred to is the difficulty in providing continuing services in rural areas. Another is the small number of new patients who can be accepted because working up a patient is so time-consuming. And, of course, there is the difficulty in recruiting trained personnel.

On the other hand, it must be most reassuring to the parents of the retarded to see how responsive physicians, health departments, social agencies and schools are to the opportunities for developing these programs. Pediatricians in private practice and in teaching positions are providing leadership in many communities in developing these services and in making possible training opportunities for medical students and physicians, nurses and others. Perhaps the greatest significance of this new interest in the retarded is that it is a reaffirmation of the value in a democracy of each of its citizens.

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Spurred by parent groups and voluntary agencies the Connecticut State Health Department has included children with nephrosis and cystic fibrosis of the pancreas in its program for handicapped children. This is the first state program of its kind and will undoubtedly be of great interest to all health workers concerned with such problems.

CARE OF CHILDREN WITH NEPHROSIS AND CYSTIC FIBROSIS OF THE PANCREAS IN A CRIPPLED CHILDREN PROGRAM

Samuel G. Dodd, M.D., and Victoria Shannon, M.S.

CHILDREN SUFFERING from nephrosis and cystic fibrosis of the pancreas, both severe chronic diseases of childhood, have recently been included in the Connecticut State Department of Health's program for crippled children. We believe that the inclusion of such children is appropriate as these diseases, now clearly differentiated from similar conditions, are amenable to medical management, are catastrophic to the affected individuals and families, and frequently require the use of resources beyond those of the family.

Connecticut is the first state to take on these new aspects of crippled children's care. This experience may help others to develop similar programs or to find better ways of helping these patients.

Origin of These Programs

The development of both the nephrosis and cystic fibrosis programs was spurred by parent groups, the Connecticut Nephrosis Society, and the Children's Cystic Fibrosis Association of Connecticut. These groups were active in urging the Connecticut General Assembly to make appropriations which would enable the Division of Crippled Children to add these two diagnoses to the program. The first appropriation to the State Department of Health for nephrosis was $12,000 for two years beginning July 1, 1953, and the first appropriation for cystic fibrosis was $25,000 for two years beginning July 1, 1955. These appropriations have since been renewed biannually with an increase in the nephrosis appropriation to a total of $21,000 in 1957.

A number of steps were taken before these programs began to operate. The staff of the Division of Crippled Children considered various aspects of proposed programs with representatives of the Connecticut Nephrosis Society and with the Children's Cystic Fibrosis Association. Faculty members of the Yale School of Medicine's Department of Pediatrics were active in contributing to the plans.

Plans were discussed with the State Medical Society whose Committee on

Public Health approved the plans which were developed. Physicians and hospitals both in and outside Connecticut gave valuable information about patients' needs. Conferences were held at Grace-New Haven Community Hospital with members of the hospital administration and with members of the nursing and Social Service Departments. One source of knowledge was a study of the needs of nephrosis patients made by a social worker at the Children's Medical Center in Boston.[1] This collaboration of a variety of persons who would be directly concerned with the programs was necessary in order to know what services were needed, which ones could be met through a State Health Department program, and what should be the bases for procedures.

Content of the Programs

The services available under the nephrosis and cystic fibrosis programs are similar to those given to children with other crippling conditions. The programs follow the purposes set forth by the Children's Bureau: to provide skilled medical, surgical, nursing, social, and physical therapy services for children in hospitals, convalescent homes, foster homes, and in their own homes, and to cooperate with other resources in providing and promoting the development of services to crippled children.[2] The programs stress the importance of planning so that the various services will be provided as they are needed. A fundamental assumption is that the services should be given in such a way that they tend to increase the possibility of the child's leading a normal life with his family. Children up to 21 years of age who reside in the state are eligible for diagnostic service. Eligibility for treatment is determined by several factors, including diagnosis, lack of other treatment facilities, the need for a planned program of medical care rather than provision of an isolated treatment, and the economic situation of the family. The consideration of economic status includes attention to the probable expenses throughout the duration of the illness and the needs of other family members, as well as income, debts, current expenses, and the desire of the family to receive assistance.

The programs may assist in care of children at home by providing medical consultation, laboratory and x-ray work, and some medication. Funds are also available for hospital and convalescent care. Depending upon the need, continuing medical, social, nutritional, and public health nursing services are provided. The parents are encouraged to maintain close touch with their family physician at all times and arrangements are made with his foreknowledge and approval. Social services are provided either by one of the consultants of the Division of Crippled Children or through referral to a local community agency. Nutritional services are obtained from the nutrition consultants of the Connecticut State Department of Health. Public health nursing is usually provided by local visiting nurse associations, advised by consultants in the State Department of Health. The other services are all purchased from existing medical resources. Drugs are supplied directly to the patients by the Division of Crippled Children on receipt of a prescription from the child's physician. Prophylactic antibiotics are dispensed to patients with either diagnosis. Pancreatin is also available to patients with cystic fibrosis. Nutrient materials including vitamins are not included. Steroid drugs which now play such a prominent part in the treatment of nephrosis are also provided.

Efforts have likewise been made to undertake educational and investigative activities. Circular letters have been sent to physicians, hospitals, and social workers concerning both programs.

Bulletins and articles [3, 4] have been prepared for Connecticut publications. A series of lectures has been given to various local medical societies by an authority on these diseases. These were arranged by the Division of Crippled Children and attended by a physician on the division staff to explain the program and answer questions. Two investigations have been completed, one a social study of nephrosis [5] and the other a study of the incidence of nephrosis [6] which, to the author's knowledge, was the first published study of this kind.

How These Programs Function

For a child to receive aid under either program a referral is usually made by the family physician or pediatrician. If the family contacts the department first, they are requested to give their physician's name and permission to confer with him is obtained. Enough medical data must be obtained to substantiate the diagnosis and to give a clear picture of the state of the disease reached by the patient. If the diagnosis has not been clearly established, this is discussed with the family and their physician so that arrangements may be made to secure the proper laboratory studies or obtain medical consultation. A pediatrician of the Division of Crippled Children reviews each case to determine whether or not all medical needs have been met and to correlate the various services received by patients.

The family is next approached by the medical social consultant of the Division of Crippled Children to determine the existing problems and needs. The interview for social evaluation is valuable because it is evidence of the department's concern for the family and because the information obtained is used in helping the family meet the difficulties associated with the illness. The parents' feelings of worth can be reinforced by recognizing the depth of their concern and their important role in the child's care. Parents who feel that they are reasonably competent, good parents can carry out the physician's recommendations more effectively and with less turmoil. Parents reveal much justified anxiety. They worry about the current condition of the child and his outlook for the future. Especially when a child has cystic fibrosis, the parents may be facing the loss of the child; they may also be deeply troubled by knowledge of the genetic factor. Parents and children have deep feelings about their separation for hospitalization. Children may have extremely limited opportunities for association with other youngsters, either because of absence from school or the physician's recommendation that other children be kept away to reduce the incidence of infections. These children are often either infants or very young children whose illness increases the difficulties of their social and psychologic development.

How to pay for the prescribed medical care is a grave concern of many families. By the time the child is referred to the Division of Crippled Children, the child may have had a number of episodes of illness and the family may have large medical debts. In addition to continuing expenses for medical care, there may be an actual reduction of income resulting from a father's loss of pay, for instance, when it is necessary for him to take the child to physicians or hospitals in towns other than the place of residence. Among families known to these programs are a number whose efforts to meet the expenses for their children's care made important changes in family plans. The most common was abandonment of plans to purchase new homes or to improve the present one. In a number of families fathers took extra jobs or mothers of young children took on employment outside the home. It has been our experience that most fami-

lies are eager to do their utmost for their children.

As implied earlier in the statement about eligibility for service, the amount of assistance from the department is determined according to the individual family's circumstances and needs. Most families carry some proportion of the direct costs. At times organizations are asked to supplement the family's payment and that of the Division of Crippled Children for items not provided in the programs. The medical social consultant may work cooperatively with hospital social workers, schools, or social agencies to bring needed services to families and children. Such help may include assisting patients and their families to deal more constructively with problems, such as their feelings regarding the illness, school adjustments, or problems not directly related to the illness.

In many cases it has been found useful to enlist the aid of the local nursing service, as will be shown in the case cited below. This is done with the approval of the local physician and is particularly vital where children are ill but not severely enough to require hospitalization. Other kinds of agencies frequently called on are parent groups, the Soldiers, Sailors and Marines Fund,* family agencies, school guidance departments, and welfare departments.

Nephrosis Program

The nephrosis program can be illustrated by the following case of a patient who was first referred to the Division of Crippled Children in February, 1954, during a hospital admission.

In brief, this patient's medical history at that time was as follows: In August, 1953, at age three years and two months, the patient's mother first noted periorbital and scrotal swelling. The child was admitted to a local hospital where it was found that he had a four plus albuminuria, a low serum protein, and an elevated serum cholesterol. A diagnosis of nephrosis was made and he was given a course of treatment with cortisone. Diuresis occurred and he was discharged as improved. In February, 1954, he had again become sufficiently swollen so that he was admitted to a hospital for further treatment. During this admission he received a course of ACTH and it was at this time that he was brought to the attention of the Division of Crippled Children.

Medical social service as well as medical care was being provided by the hospital. Hospital bills were being met by the Soldiers, Sailors and Marines Fund, as the family income was barely sufficient to meet ordinary needs.

In July, 1954, the child was readmitted to the hospital for another course of ACTH because of recurring edema. Treatment resulted both in diuresis and clearing of albumin from the urine; because of these repeated hospitalizations, his home situation was looked into more closely. The parents seemed fond of him but unable to follow the recommendations for various reasons, including the care of three small children. He was not sent home following this admission, but was transferred to a convalescent facility where he received steroid and prophylactic antibiotic therapy. The social worker at the convalescent facility reported that the boy adjusted well there after an initial period of unhappiness. Efforts were made to work with the family to help them have more understanding of their child's problems. Expenses of medical care were shared by the Division of Crippled Children and the Soldiers, Sailors and Marines Fund.

The patient was discharged from the convalescent home in April, 1955. At that time his urine was free of albumin

* A tax-supported assistance program to aid needy veterans of this state and their dependents.

and he was on a medical regimen of cortisone, terramycin, and potassium acetate. Since then he has had two serious relapses with considerable edema and albuminuria, requiring hospitalization and more intensive steroid therapy. At present he is edema-free and looks like a normal child, but has persistent albuminuria and requires continuing steroid therapy.

Further study of the boy and his family by the medical social consultant brought out factors which the physician, social worker, and public health nurse now keep in mind constantly in working with the family. The parents appear to feel that professional people look down on them, since they are uneducated and barely able to be self-supporting. They seem to meet situations where they feel inadequate by a lack of response to what professional workers may suggest. Since the last hospitalization, more effort has been made by the medical social consultant in the Division of Crippled Children and the local visiting nurse to supplement the physician's instructions by paying more attention to the needs of the mother. It was noted that the mother is with her own mother a great deal. The social worker and visiting nurse found that the mother relaxed and became more communicative when they assumed a supporting role. At this time it seems that the attention the mother received has enabled her to give more attention to her child. She has been bringing him to clinic more regularly, rather than waiting for an increase in severity of symptoms.

In summary, the care of this child has been made possible by the coordinated efforts of several community resources; the hospital and its outpatient department, the convalescent home, the local visiting nurse association, the Soldiers, Sailors and Marines Fund, and the Division of Crippled Children. The Soldiers, Sailors and Marines Fund, in a period of slightly more than three years, has paid a total of $3,077 for hospitalization and medication. The Division of Crippled Children has paid $1,166 for hospitalization. The visiting nurses have not estimated the cost of their time as the services have been provided for various members of the family.

As a result of this coordinated activity, the family has been relieved of a considerable burden and the patient has received better, more consistent medical care. This case is an example of the Division of Crippled Children's threefold role of (1) providing medical care, (2) mobilizing other resources, and (3) planning and consulting with local agencies in order to bring about an understanding of the family which would enable it to make more effective use of services available.

Cystic Fibrosis

Although the programs for nephrosis and cystic fibrosis are similar, there are differences due primarily to differences in the clinical picture of the two diseases. The operation of the cystic fibrosis program may be seen in the following case report involving two sisters.

Joan and Mary, at ages eight months and four years, respectively, were first referred to the Division of Crippled Children in November, 1955, by their family physician. He stated they both had cystic fibrosis and were each receiving the following medication: a pancreatic enzyme preparation, tetracycline for prophylaxis against respiratory infection, and a vitamin preparation. Joan had meconium ileus at birth and was operated on for this condition on the second day of life. Her postoperative course had been satisfactory and she maintained an adequate weight gain. No further diagnostic studies were performed, the diagnosis being

based on the findings at the time of surgery. Mary, also, was assumed to have cystic fibrosis, but needed confirmatory studies. Detailed diagnostic study of both children was carried out at a medical center. This was arranged and paid for by the Division of Crippled Children. This study confirmed the diagnosis in the case of Joan, but proved conclusively that Mary did not have cystic fibrosis. Since that time Joan has been maintained in relatively good health under cooperative supervision by a pediatrician in the medical center and her family physician. She has been receiving both prophylactic antibiotics and a pancreatic preparation from the Division of Crippled Children.

The family has been seen by the medical social consultant of the Division of Crippled Children from time to time and has been helped with some of their problems. The father felt guilty because a statement made by one physician led him to conclude that he was responsible for Joan's illness. Partly through subsequent explanations and partly because of an opportunity to express their feelings, both parents have been able to accept the illness as a misfortune for which they do not need to blame themselves or each other. The two children had been isolated from others so as not to pick up any infection. Later this advice was changed and Joan attends school regularly. The parents had been advised by a physician against bearing more children, as cystic fibrosis appears to be inherited as a Mendelian recessive. The mother is now pregnant and the parents are both worried about the possibility of having another child with cystic fibrosis. They have been reassured that the Division of Crippled Children will pay for diagnostic laboratory studies if indicated. In this particular family the concern over the illness being fatal has been diminished by the good progress of the child.

Discussion

While these two case histories are typical of the two programs, we have found that each patient presents a unique problem. In a few cases services have been more or less limited to financial support, generally in the form of providing drugs or paying for hospitalization. In other cases, our services have been less tangible but in many instances of greater significance. For example, in cases of suspected cystic fibrosis where the diagnosis has been ruled out by appropriate laboratory tests, the parents and child have been relieved of an emotional burden that might have otherwise carried for years. Consideration of a family's total situation has enabled numerous families to utilize local resources hitherto unknown to them. Most notable here have been the visiting nurse associations, family agencies, and parent groups.

The medical social consultants of the Division of Crippled Children have been in close contact with each family and have provided support when needed. Particularly in cases of cystic fibrosis families have been helped to deal with their feelings and to answer children's questions which arise from the serious nature of the disease and publicity about it.

During the period from July, 1953, to March, 1957, 42 patients with nephrosis were helped in one way or another. Of this number, 27 required 55 different periods of hospitalization, and 26 required help in obtaining antibiotics for prophylaxis against respiratory infections. During the shorter period from July 1, 1955, to December 31, 1956, 51 patients were referred to the cystic fibrosis program. Of these, 35 received drugs and there were 15 hospitalizations. Eleven patients with doubtful diagnoses were given diagnostic sweat tests and in eight cases cystic fibrosis was ruled out. Laboratory, x-ray, and consulta-

tion fees were paid for an additional number of patients with cystic fibrosis and nephrosis. The findings of the study of nephrosis patients referred to earlier suggest that since the inception of the program more regular clinic visits occur and there have been fewer repeat hospitalizations.

We endeavor to maintain contact with all patients by one means or another, and patients are not removed from the program unless they die or move out of the state. We feel that the Division of Crippled Children has been an important force in consistent planning with the families and their physicians for the meeting of the children's varied needs.

These patients need more services. Increased funds could lead to better service to physicians and hospitals. We feel that greater efforts should be made in the field of education. This is particularly true in cystic fibrosis, a disease about which many physicians and nurses need to be better informed. Care of patients in their own homes could be improved if more consultation by appropriate staff members could be provided to social workers, visiting nurses, physicians, and parent groups as requested. Doubtless more could also be done in case finding.

In general, we feel that the inclusion of these new diagnostic groups in the crippled children's program has been of value and that services to these children should be expanded in the future.

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Fourth Nuclear Conference

The 4th Nuclear Engineering and Science Conference will be held in the Chicago International Amphitheatre, March 17–21. Coordinated by the Engineers' Joint Council, the conference is sponsored by more than 30 engineering and scientific societies, among which is the American Public Health Association. Approximately 200 technical papers will be presented in 25 technical sessions. Among the topics to be discussed are health physics and instrumentation, waste treatment and disposal, water contamination and treatment, and reactor safety.

The advance program, which will be available in January, will include a list of the papers that will be preprinted and available for purchase at a nominal charge.

The program and the list may be obtained from the Secretary, Engineers' Joint Council, 29 West 39th Street, New York 18, N. Y.

The December, 1957, Journal carried an article by Dr. George W. Anderson on research programs in human reproductive wastage. The implications for public health of such research are spelled out here. A brave new world opens up before the reader's eyes and beckons invitingly.

RESEARCH IN HUMAN REPRODUCTIVE WASTAGE: IMPLICATIONS FOR PUBLIC HEALTH

John Whitridge, Jr., M.D., F.A.P.H.A.

IN ASSESSING the public health implications of research in reproductive wastage let us look briefly at the present situation in maternal and child health, with particular attention to maternal health. Among the many important developments of the past few years, two in particular should be recognized. First, in this country, at least, many of the problems concerned with the quantitative survival of mothers and children have largely been solved, or at least knowledge is available which if applied makes solution possible. (This is not so true in many less fortunate areas of the world, still struggling with the more basic aspects of maternal and child health.) As a result, however, we in the United States are devoting more thought and effort to emphasis on the quality of survival, particularly in relation to the product of conception and the welfare of the whole family. This is an encouraging trend.

A second, but disturbing, development is that the field of maternal and child health is now so well accepted that in some degree it has become "cold turkey." Illustrative is an event that took place recently at the hearings on the budget of the State Health Department before the Maryland Legislature. One of the younger legislators who had been listening for several hours to plans for spending hundreds of thousands of dollars on mental health, cancer cytology, chronic disease hospitals, virology laboratory services, and so forth, without raising an eyebrow, suddenly came across an item in the budget book that surprised him and he asked "Oh, does the health department have clinics for expectant mothers?" The first health department maternity clinics had probably been started long before he was born, but they have become such a routine part of public health as to be unnoticed among the newer, more dramatic programs. In this consequence of success, in this acceptance as routine there lies grave danger ahead. By far the most important aspect of this exciting new research in reproductive wastage is the golden opportunity it affords us to revitalize maternal and child health and to make it a challenging field that will ultimately yield answers to many of mankind's most pressing problems. Some of the important unsolved questions concern the factors, constitutional and environmental, that arrest or distort development of the fetus in utero or shortly thereafter, factors that tend to produce all types of congenital defects, behav-

ioral as well as physical. What are the factors related to conditions that underlie socially maladjusted behavior, such as schizophrenia, alcoholism, and mental retardation; and what is the developmental period of greatest vulnerability to these conditions? More specifically, knowledge is needed about the causes of premature onset of labor, of eclampsia, the factors leading to spontaneous abortion, exact methods for early detection of oxygen lack to the fetus, the effect on the fetus of maternal nutrition and of various drugs and biological agents, such as viruses. Answers to many of these challenges will be found only through newer ways of studying more precisely the why and the how of intrauterine development.[1]

To implicate means "to bring into intimate connection, involve, infold, entangle." How, then, are we to connect intimately ongoing research and public health? The term, public health, is used in this discussion in a very broad sense and is not limited to the role of health departments. On this basis, here are a number of ways in which the new concepts of reproductive wastage might be used to renew interest in maternal and child health and obstetrics.

Obstetric Teaching—Since those who learn today are the hope for tomorrow, this is a logical starting point. If obstetrics is to meet the challenge, we must begin to train obstetricians, nurses, and allied workers who will have an entirely new concept of obstetrics. Preoccupation with the mechanics of pregnancy and delivery must give way to the wider view that answers so many questions that have defied us throughout the centuries. This lies in intensive study of the whole process of human reproduction and human relationships. No longer will it be enough to evaluate the capacity of the female pelvis to allow the passage of a child. More, much more, attention will have to be given to the woman's capacity to produce a vigorous, healthy infant and to be an adequate mother to the child. Do not misinterpret these remarks. Most of the tremendous progress that has been made in maternal health in the past few decades has been founded upon the provision of good basic clinical obstetrics to an ever-increasing segment of the world's population.[2] High-quality clinical obstetrics remains as essential as ever, but upon this sound foundation we must erect a wider concept, a concept of the reproductive process as the laboratory par excellence in which research will find the answers to many vital problems. The cooperative prospective study of the etiology of cerebral palsy and related neurologic defects is but one example of our awakening to this truth.

This means a change in our teaching. Medical students, student nurses, residents, and interns must be led to understand and to assimilate this broader and more exciting concept of obstetrics and its relationship to other fields of human endeavor. This will mean the inclusion on the teaching staffs of obstetric departments not only of pediatricians and pathologists as is often the case today, but as well of neurologists, psychiatrists, geneticists, physiologists, sociologists, and so forth. By working with such teams the horizon of the obstetrician and the maternity nurse will be immensely widened. No longer will the interest of obstetricians be confined to the 300 or so days in the life of a woman beginning with conception and ending with her postpartum examination when her child is six weeks old. Preconceptional and postpostpartum events will become equally or even more important. Yes, even fathers will be important people, and eventually become more than a statistic listed under identifying data.

Personnel—To make even a small start toward this broader concept will require time and people and, as usual, money. If obstetricians of the future

will also be physiologists, chemists, pathologists, and sociologists stressing research, who will be available to give mothers the high quality hour-by-hour care that is so essential? I believe we have a person ideally suited for this task—the nurse-midwife. The certified nurse-midwife is competent to conduct the course of normal labor, perform normal deliveries, and to work on the obstetrical team in such a way as to relieve the new high-powered obstetrician of the performance of duties that in most instances will not require his advanced skills. He would be available when things went wrong, but not for normal labors and deliveries. A pattern of this type would probably do much to make both obstetrics and maternity nursing more popular fields. The rugged life imposed by long, unpredictable hours of work is no doubt an important factor in their unpopularity. But is it not also probable that our present narrow concepts have been equally responsible for their lack of appeal? The evolution from maternity nurse to nurse-midwife with the attendant increase in responsibility and sense of achievement should certainly make recruitment easier in the field of nursing. Training facilities for nurse-midwives will have to be increased a hundred-fold and more. The metamorphosis from mechanical accoucheur to obstetrical scientist should prove more alluring to young physicians.

What, then, of the practicing physician in the field of obstetrics? Do all obstetricians put on long white coats and retire to a laboratory? Not at all. With this new concept of obstetrics the physician assumes an even more important role than before. There will still be the private practice of obstetrics, but with the obstetrician giving primary attention to the broader aspects of his specialty including psychologic and sociologic as well as physical care. He will use his specialized background and surgical skills, and turn over to his co-worker, the nurse-midwife, more of the regular technical aspects of the care of normal pregnant women.

Relation to Other Specialties—That there is a relationship between the reproductive process and its attendant hazards to the fetus and the ultimate development of the many various crippling conditions of children is generally conceded, even though the exact mechanisms of production are often not known. Cerebral palsy, mental retardation, various neurologic defects, to name only a few, are conditions presumably originating in utero or in passage through the birth canal.[3] Is it too far-fetched to imagine that there may be a hitherto unsuspected relationship between intrauterine life and the development of certain chronic illnesses in older persons? For example, 10 minutes of hypoxia may cause permanent brain damage to one fetus. Might not another fetus subjected to the same lack of oxygen suffer permanent damage to the coronary vessels and be predisposed to myocardial infarction at age 35 or 40? Radiologists and geneticists are certainly becoming increasingly interested in the effects of radiation on the unborn fetus, either from natural radiation, x-ray pelvimetry, or atomic fallout.[4]

Hospitals—Aside from the many obvious implications to hospitals in what has been said, there are several special problems which sooner or later the hospital administrator must face, if and when the old order changes. First, more obstetric beds will be needed, particularly for women with prenatal complications requiring prolonged and often expensive hospitalization. One or two examples will suffice. The treatment and control of preeclampsia with avoidance of delivery of a premature infant and the prevention of spontaneous premature onset of labor in an apparently normal patient often require weeks of hospital care. The magnitude of the problem of premature onset of labor is

indeed great. There is probably no other single catastrophe that has such a profound effect upon both the quantity and quality of newborn survival. Until such time as our new obstetrical scientists explain the cause of the normal onset of labor at term, prolonged hospitalization, with or without expensive endocrine therapy, seems our only hope of success. This therapy is costly, but no more so than caring for the premature infant after delivery, nor does the best of pediatric care remove the threat of neurologic or other disability in prematures, for this is basically an obstetrical problem.

A second responsibility hospitals must prepare to assume is that of maintaining improved records and reporting. Every delivery will have added importance, since it will have become part of a vast nation-wide, even world-wide, research project. If we could predict, during the mother's pregnancy, which child will turn out to be mentally ill, retarded, or have cerebral palsy, records would not be so crucial. But since advance knowledge of this type is not possible (a blessing for prospective parents), the only hope of establishing cause and effect relationships is by means of accurate complete records of every pregnancy, labor, and delivery. Hospitals and individual nurses and physicians will be more ready to devote added time to record-keeping only if they feel they are playing a part in an important new adventure. Record-keeping for the sake of keeping records that have little or no expected usefulness will never be successful.

A third problem for hospitals will be that of establishing special facilities for women with previous pregnancy wastage. These patients are known to be a high-risk group,[5, 6] and all women with previous abortions, fetal deaths, neonatal losses, or defective offspring must have intensive study and care by a specially trained staff. This is, of course, not peculiar to hospitals, but involves all medical services for women inside and outside of hospitals. Such services are time-consuming, costly, and require special planning.

Health Departments — The implications for health departments are limitless, ranging from modest increases in "routine" services to the fundamental responsibility of primary leadership. More will be said of leadership later, but short of that, there are several vital functions which should be logical responsibilities of health departments. The first of these should be community coordination of all groups devoting their energies to this expanded concept of maternal health. Private physicians, hospitals, medical and nursing schools, training centers for nurse-midwives, other public and private agencies, medical societies, and many others will need to work according to a prearranged pattern that avoids duplication of effort and follows an integrated plan of attack. The diversity of activities and contacts, and the community-wide coverage characteristic of health departments make them ideal coordinators.[7]

If pregnant women are to receive the benefits of any new type of special care, nurses, physicians, and allied maternal health workers will have to devote more time to them. This will be especially true for the women with previous pregnancy loss mentioned earlier. Furthermore, women whose children have behavior problems or are potential delinquents are just as much members of the group requiring special care as those whose children have clear-cut gross brain damage or other physical defects. A recent committee recommendation in Maryland illustrates this view. The Health Committee of the Governor's Commission on Juvenile Delinquency [8] made a firm unequivocal recommendation that health departments double the number of maternity clinic sessions. Note that this occurred in discussing the

prevention of juvenile delinquency, not the prevention of gross brain hemorrhage or congenital heart disease. The basic intent was to give nurses, physicians, social workers, nutritionists, and others at least twice as much time to spend with each pregnant woman, not for more physical evaluation, but for the discovery of and attention to underlying emotional and psychologic problems which are so often neglected in the hustle and bustle of doing venipunctures and taking blood pressures. Preparing women to be good mothers during pregnancy was felt to be a primary step at an optimum time for the prevention of juvenile delinquency. And once again, father was brought into the picture by recommending greatly increased emphasis on parents' classes to assist husband and wife to grow together in their abilities to assume the role of parents.

Health departments will also have an important role in records and reports. Trouble spots can be picked out via birth and death certificates and pertinent epidemiologic surveys of pregnancy wastage undertaken. In addition, the task of collecting, interpreting, and disseminating information concerning current research could fall to health departments. Collection and dissemination of information are relatively easy, provided one has sufficient time to read the mass of material that crosses one's desk and enough mimeograph machines to record pertinent information. Interpretation is the key required to unlock this storehouse. Needed for this function will be persons familiar with what is going on, with enough background to make good assessments of the value and possible application of new research, and an opportunity to consult directly with those engaged in research.

Leadership—Strong, intelligent leadership will be necessary to make progress along the lines mentioned. The quality of leadership is infinitely more important than any other factor in deciding which group or agency will assume the leader's role. Actually local conditions should be the determining factor and in any given community the strongest group should undertake the spark-plug function. The medical societies, specialty medical groups, and the medical schools, hospital associations, nurses' associations, and health departments among others all have a vital interest. But there is one group that in my opinion is perhaps ideally suited to direct a venture of this sort—the maternal and child welfare committees. Most communities have such a committee, though it may have some other name. Usually it is composed of public-spirited physicians who volunteer their time and meet perhaps once a month or maybe only once or twice a year. Most of these committees were brought into being to review maternal and/or selected types of fetal or neonatal deaths. Their basic purpose was educational and, undoubtedly, they have done much to improve the standards of obstetric and pediatric care in communities where they have operated. Without any desire to diminish credit for past achievements, I suggest it is time for these committees to reexamine their roles. Would it not be possible for them, with the addition of a modest, paid full-time staff, to spearhead, direct, and instill enthusiasm for the "new look" in maternal health? Serving as a board of directors, the committee could delegate various components of the job to be done to the most suitable groups, thus bringing everyone into the picture, establishing a coordinated pattern, educating, convincing, selling ideas, and smoothing ruffled feathers.

Thus far we have scarcely mentioned the most important persons of all—the consumers—Mr. and Mrs. Expectant Parent. They will ultimately get what

they want and we will have to give it to them. Our most important job, therefore, is to teach them to want what will produce the greatest benefits, not only for them, but for their children and their children's children. Today any matter relating to medicine seems to have great popular appeal. We should make bold plans and just as boldly take the public into our confidence. The woman who is punctured in the arm eight times during pregnancy to see what her antibody level is against Coxsackie group virus deserves to know that she is playing a part in a tremendous new research project. Also, there should be ample lay representation on the maternal and child welfare committees in every community. There will be no widespread enthusiasm for the kinds of things I have been trying to describe until there is intelligent, hearty cooperation from the consumer.

In summary, then, I propose the following six-point program of action:

1. That the present concepts of obstetrical teaching and training be carefully reexamined with an eye to widening vastly the scope of obstetrics as a science.

2. That the training of certified nurse-midwives be undertaken on a scale never before attempted in this country, with the objective of making available complete maternity care to an ever-increasing proportion of our population. In so doing, both the obstetrician and the nurse-midwife with their special skills and broadened viewpoint will play a more important part than ever before in providing high-quality maternity care.

3. That workers in obstetrics and maternal health cooperate on an ever-expanding scale with workers in other basic health fields on a multitude of research projects where they have mutual interests and concerns.

4. That all hospitals, large and small, be made aware of the vital role they play in basic obstetrical research and in making possible further progress in the broad field of maternal health.

5. That health departments undertake to promote and further in every way possible a coordinated pattern of maternity care and research in maternity care based on the preceding concepts with particular emphasis on obtaining understanding and cooperation from the lay public.

6. That committees on maternal and child welfare, or their counterparts, in each community be urged to reexamine their functions in the light of present knowledge and to assume leadership in moving forward into new fields.

We have only to push open the door to cross the threshold and enter a new era that will vitally affect the lives and future well-being of at least 100 million potential new human beings each year throughout the world. This means that we probably hold the key to survival and happiness for more people in the world than any group except those who control the trigger of nuclear weapons. May both groups show strength, wisdom, and imagination in carrying out their responsibilities. I would like to hope that the writer of the following words might have approved of what has been said. "If we continue merely the routine activities of the past, the health officer will be merely a cog in an essential but undistinguished administrative machine; only with a bold approach to meet the new demands of the time shall we earn the sense of real achievement which comes to the pioneer." The author of those words was none other than C.-E. A. Winslow.[9]

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Books for Asia Requested

The Asia Foundation is a nonprofit, nonpolitical organization founded—"to encourage and strengthen active cooperation on mutual respect and understanding among voluntary organizations—Asian, American, and international." Among its activities is its "Books for Asian Students," through which it has shipped more than 600,000 copies of textbooks and journals to universities in the 15 countries of "free" areas of Asia that have requested them.

Items in every category on the university and college level, in good condition, published in 1948 or after, and works by standard authors regardless of date, are requested. A five-year consecutive span of copies of the American Journal of Public Health and other technical journals are especially asked for.

Transportation costs from the donor to San Francisco and thence to Asia will be borne by the Foundation for substantial shipments. Please do not ship books or periodicals to the American Public Health Association. Please address Books for Asian Students, 21 Drumm Street, San Francisco 11, California, to obtain instructions for shipping.

Suppose a community is interested in supplementing a water supply which already has a certain amount of fluoride. On what bases can and should a decision be made? What factors ought to be taken into account? A way of developing an answer is presented in this analysis.

CRITERIA TO CONSIDER WHEN SUPPLEMENTING FLUORIDE-BEARING WATER

David F. Striffler, D.D.S., M.P.H., F.A.P.H.A.

As a public health official—engineer, health officer, or dentist—one may be approached by the mayor of a city somewhat in this fashion: "Say, some people have been after me to fluoridate our city water. I told them there already was fluoride in the water, but they say there isn't enough.. What do you think?"

What does one answer? When is drinking water deficient in fluoride? Is supplementation indicated at 0.7 ppm F or should a community wait until it is as low as 0.5 ppm F?

The purpose of this paper is to explore some criteria one should consider when the supplementation of a fluoride-bearing community water supply is under discussion. The most logical first step would be to evaluate the water supply, itself, and the amount of fluoride already in the water. How many sources of water are there? Are there individual variations in the amount of fluoride present in the various sources? Maybe a relatively high-fluoride well could be pumped more, and a fluoride-deficient well be pumped less or shut down altogether. What has been the seasonal pattern in the amount of fluoride present? What has been the pattern over a number of years? Perhaps drought has affected the amount of fluoride as the water table has dropped. How many fluoride determinations have been made?

How stable is the water supply? Possibly the community is considering a change or prospecting for new water. Consultation with those in a position to know (usually the consulting or public health engineers) is indicated. Once the situation has been assessed and a fluoride value can be assigned, then the next question can be raised and answered. When is drinking water deficient in fluoride?

The classical 21-city study by Dean [1] established 1.0 ppm F as about the optimum for the United States in general—that is, the amount expected to reduce dental caries most effectively and still not produce cosmetically objectionable dental fluorosis. Of the 21 cities, only two Colorado cities, Colorado Springs and Pueblo, were not from the adjoining midwestern states of Illinois, Indiana, and Ohio.

Warm climates have been shown to increase the amount of water consumed and, hence, to decrease the amount of fluoride necessary to achieve optimal

caries reduction.[2-4] Some of the northern tier of states are recommending more than Dean's 1.0 ppm F.[5, 6] Hence, 0.7 ppm F may be adequate for Jacksonville, Fla.,[7] whereas it might be considered deficient in North Dakota. Galagan and Vermillion[6] have worked out a neat formula to calculate optimum fluoride levels for unusual climatic areas. For such areas the examples, tables, and graphs given in this paper may be modified accordingly. (For an excellent example of assessing the special problems, including climate, of a particular fluoride area see Richards, et al.,[8] in the October, 1957, Journal of the American Dental Association.) In this paper we will assume that climate does not enter

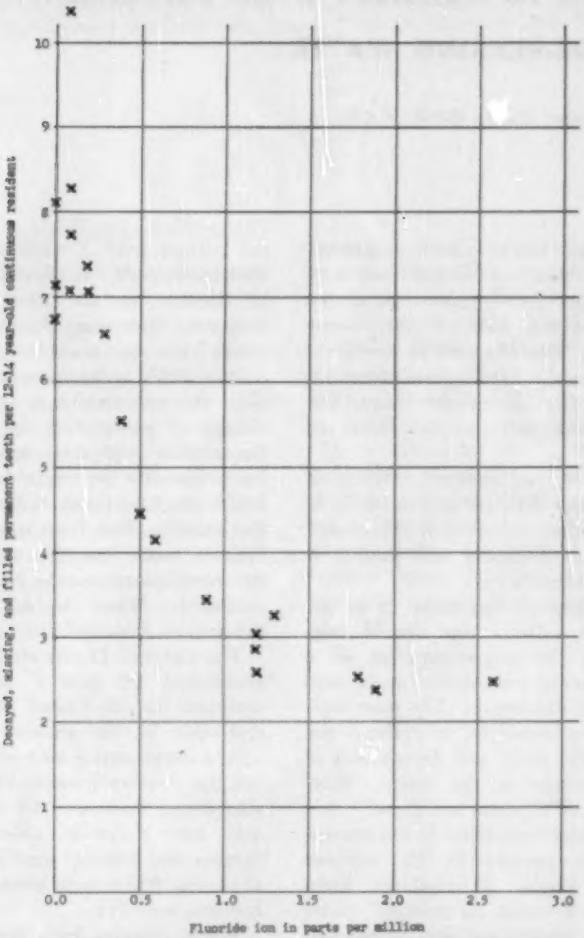

Figure 1—Relation of Average Number of DMF Teeth per 12–14 Year-Old Continuous Resident to Fluoride Content of Drinking Water of 21 Cities in the United States (Dean's Original 21 Cities[1])

further into the picture and that the climate of the Chicago area is representative of the country in general.

Figure 1 (an adaptation of Dean's [1] original 21-city graph) plots dental caries experience in terms of average DMF against ppm F. At around 1.0 ppm F the curve levels off. Hence, Dean concluded that very little additional return (in terms of lowered DMF rate) could be achieved by more fluoride. The curve drops precipitously until it approaches 1.0 ppm F. As the leveling off process begins, a point of diminishing return is reached.

Paraphrasing Webster's [9] definition of "diminished return" in dental terms would sound something like this: "The observed fact that the increase in fluoride content beyond a certain point results in a less than proportionate reduction in dental caries." For example, for the first half part per million of fluoride applied a reduction of about three DMF is realized. For the second half about two DMF is realized.

Between 0.5 and 1.0 ppm F there are only two cities (Kewanee, Ill., and Pueblo, Colo.) helping to determine the slope of Dean's curve. And this is the portion of the curve which apprises one of the extent of the reduction in DMF to be expected at 0.6, 0.7, 0.8, and 0.9 ppm F. Hence, with the cooperation of the regional offices of the Public Health Service and of individual state dental directors, additional data were secured to supplement Dean's. (Data received for cities in warm climates such as Jacksonville, Fla., and Phoenix, Ariz., have not been included.) (See Table 1.) It is recognized, of course, that (1) many

Table 1—Relation of Average Number of DMF Teeth per 12–14-Year-Old Continuous Resident to Fluoride Content of Drinking Water of 57 Cities in the United States

City and State *	ppm F	No. of Continuous Resident 12–14-Year-Olds Examined	Total DMF Teeth	Average DMF Teeth
"a," Ill.	0.00	471	3,839	8.15
WAUKEGAN, ILL.	0.00	423	3,427	8.10
Port Angeles, Wash.	0.00	169	1,257	7.44
OAK PARK, ILL.	0.00	329	2,374	7.22
EVANSTON, ILL.	0.00	256	1,723	6.73
Tacoma, Wash.	Traces	270	2,406	8.91
Santa Fe, N. M.	Traces	180	1,270	7.06
Yakima, Wash.	Traces	148	987	6.67
La Porte, Ind.	0.05	471	3,844	8.16
Fargo and Bottineau, N. D.	0.05	326	2,600	7.97
Austin, Minn.	0.06	1,295	10,102	7.80
MICHIGAN CITY, IND.	0.10	236	2,448	10.37
"b," Ill.	0.10	5,043	48,316	9.58
ELKHART, IND.	0.10	278	2,289	8.23
PORTSMOUTH, OHIO	0.10	469	3,622	7.72
QUINCY, ILL.	0.10	330	2,329	7.06
Sedalia, Mo.	0.18	227	2,064	9.09
"c," Ill.	0.20	311	2,713	8.72
Mitchell, S. D.	0.20	45 (13 yrs. only)	372	8.27
Wenatchee, Wash.	0.20	77	603	7.83
ZANESVILLE, OHIO	0.20	459	3,366	7.33
MIDDLETOWN, OHIO	0.20	370	2,601	7.03
Chillicothe, Mo.	0.26	46	359	7.80

* Dean's original 21 cities designated by capital letters.

Table 1—(continued)

City and State *	ppm F	No. of Continuous Resident 12–14-Year-Olds Examined	Total DMF Teeth	Average DMF Teeth
LIMA, OHIO	0.30	454	2,962	6.52
Jacksonville, Ill.	0.30	157	1,004	6.39
Huron, S. D.	0.35	63 (13 yrs. only)	492	7.80
Hutchinson, Minn.	0.35	333	2,595	7.79
MARION, OHIO	0.40	263	1,461	5.56
Bismarck, Mandan, Williston, N. D.	0.45	343	1,754	5.11
Jefferson City, Mo.	0.49	156	766	4.91
Omaha, Neb.	0.50	109 (13 yrs. only)	535	4.91
"d," Ill.	0.50	222	1,005	4.53
ELGIN, ILL.	0.50	403	1,789	4.44
Kansas City, Kans.	0.50	468	1,920	4.10
PUEBLO, COLO.	0.60	614	2,528	4.12
Fort Dodge, Iowa	0.60	240	799	3.33
Elgin, Ill.	0.60	448	1,443	3.22
Cherokee, Iowa	0.70	50	101	2.02
Charles City, Iowa	0.80	39	130	3.33
Fulton and Mexico, Mo.	0.87	123	259	2.11
KEWANEE, ILL.	0.90	123	422	3.43
Denver, Colo.	0.90	197 (jr. high age)	604	3.11
Union Grove, Wis.	1.00	135	392	2.90
"e," Ill.	1.10	254	521	2.05
EAST MOLINE, ILL.	1.20	152	461	3.03
AURORA, ILL.	1.20	633	1,778	2.81
Kimberly, Wis.	1.20	116	302	2.60
MAYWOOD, ILL.	1.20	171	442	2.58
JOLIET, ILL.	1.30	447	1,443	3.23
Columbia, Mo.	1.32	131	263	2.01
Oconto, Wis.	1.50	151	438	2.90
Kaukauna, Wis.	1.80	177	496	2.80
ELMHURST, ILL.	1.80	170	429	2.52
GALESBURG, ILL.	1.90	273	643	2.36
De Pere, Wis.	2.00	154	400	2.60
Green Bay, Wis.	2.30	1,647	4,282	2.60
COLORADO SPRINGS, COLO.	2.60	404	994	2.46

* Dean's original 21 cities designated by capital letters.

different examiners were involved in the various surveys from which these data were obtained; and that (2) in some instances the sample size is hardly adequate. The comparability of the data is therefore open to question. However, they were checked for comparable age group (12–14), continuous residents, fluoride levels, method of examination (mouth mirror and explorer), and for sampling procedures. Figure 2 shows the graph obtained from these new data—a graph similar to Dean's.

Combining Dean's 21 cities with the new data resulted in the graph shown in Figure 3.

It is apparent from the plottings in Figure 3—note particularly the scatter of the plottings in the crucial area of 0.5 to 1.1 ppm F—that additional data are needed before a firm relationship can be established. Perhaps, too, sep-

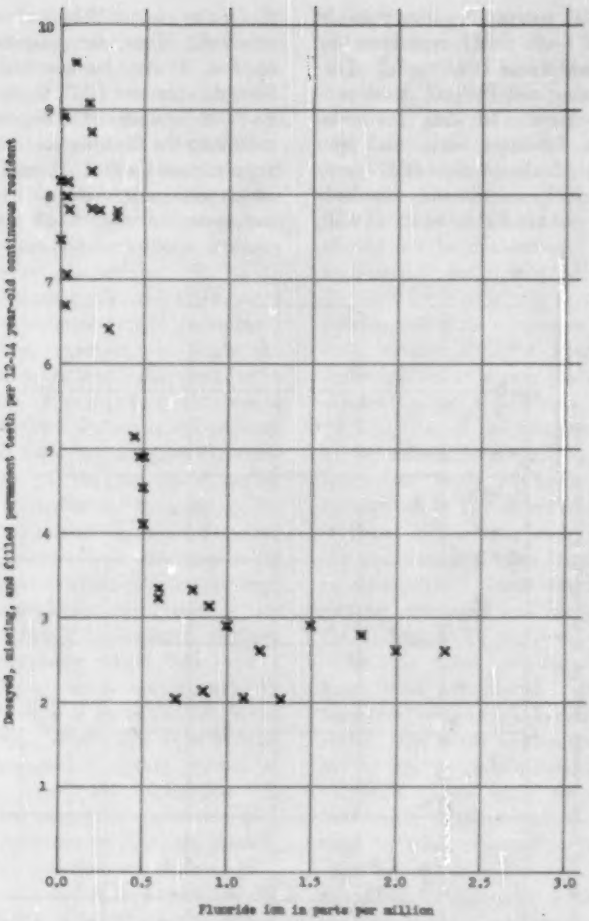

Figure 2—Relation of Average Number of DMF Teeth per 12–14 Year-Old Continuous Resident to Fluoride Content of Drinking Water of 36 Cities in the United States

arate graphs can be formulated for cool, average, and warm climates.

However, the graph (Figure 3) obtained from the conglomerate data may be used to predict roughly the possible amount of reduction in DMF to be expected at a given level of fluoride. For example, if the initial fluoride level is 0.7 ppm F, the possible reduction to be achieved by raising the level to 1.0 might be only about one DMF. Perhaps the phrase ". . . only about one DMF" should not have been used. Maybe it would be better to put the reduction in terms of dollars and cents, because cost can be a prime factor when considering this problem. Then, too, a DMF reduction of this magnitude will not be obvious in the children of a community.

How much would be realized in sav-

ings to dental patients by the possible reduction of tooth decay experience by one or two additional DMF teeth? Fortunately, Young and Pelton [10] have provided some leads. In their adequate-fluoride city of Nampa, Idaho (1.5 ppm F) the rate of almost two DMF teeth for 13-year-old continuous residents would have cost (in 1954) about $10.50, that is, to restore those permanent teeth attacked. Thus, for purposes of speculation, it may be assumed that in a fluoride area one DMF tooth would cost $5.25 to restore. Consequently, if, by enriching the fluoride content of a water supply from 0.7 to 1.0 ppm F, the caries attack rate were reduced by one DMF, the savings for each 13-year-old child

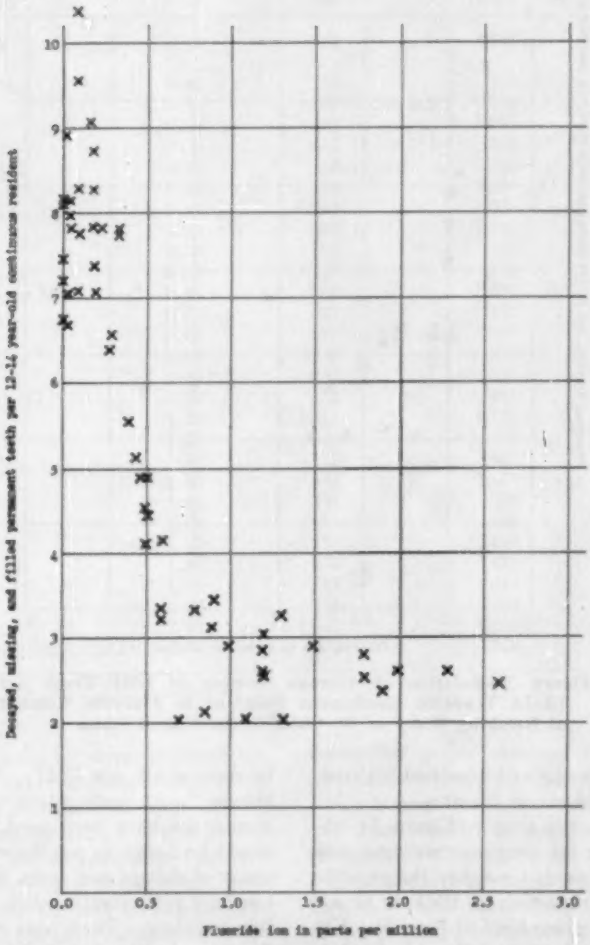

Figure 3—Relation of Average Number of DMF Teeth per 12–14 Year-Old Continuous Resident to Fluoride Content of Drinking Water of 57 Cities in the United States

would be about $5.25. In 1955, 1.4 per cent of the population in the United States was 13 years old.[11, 12] A hypothetical city of 35,000 would have 490 13-year-olds. The mayor can begin to get an appreciation of the savings when he realizes that $2,572.50 would be saved for just this 13-year-old segment of his community. This type of assessment could be expanded to include primary teeth and other age groups.

Yardsticks other than the DMF index may have more meaning to community officials. For example, it might be worth while to estimate the increase in the per cent of youngsters who would show no obvious decay at all as contrasted with the lesser per cent presently experiencing no obvious dental caries.

Another criterion to consider is the prevalence of dental caries in the community. Conceivably, a situation could exist where an extremely high consumption of refined carbohydrates is ingrained as part of the cultural pattern. Such a community might well have a relatively high caries attack rate despite the presence of some fluoride in the water supply. Where this type of situation is suspected a survey would be indicated to verify the impression. If verified, then enriching the water supply to the optimum level would become much less of a matter for debate.

Obviously, another criterion would be the number of children who might be expected to benefit by the water supply under consideration. The more young children served, the more important an optimum level of fluoride becomes.

So far only what would be realized in tangible benefits has been discussed. What would it cost to achieve these benefits? What about capital outlay and operating costs at the waterworks? Perhaps a new building will have to be built. How expensive will the fluoridation equipment be? Multiple installations may be necessary. What fluoride salt is indicated?

In most cases the capital outlay will be the same whether one ppm F or only half that is necessary to achieve the desired level. However, the actual cost of the chemical will be less if a full ppm does not have to be added, but only a fraction thereof. This saving should not be discounted. It has been estimated[13] for a city of 35,000 that for each tenth of a ppm that the fluoride level is raised the chemicals alone would cost around $250 a year—less than three-fourths of a cent per capita. Ten one-tenths, or a full ppm, would cost $2,500. So, if the fluoride level needs to be raised from 0.7 to 1.0 ppm F instead of from 0.0 to 1.0 ppm F, a savings of $1,750 is realized each year.

These engineering and cost accounting problems will vary from community to community. The costs in each case can be estimated and weighed against the savings to be realized.

To this point only tangible criteria have been considered. However, intangibles can weigh heavily. For instance, how many toothaches are hidden in the dental public health jargon of "DMF"? How many sleepless nights, how much needless pain, how much distress for parents could be prevented by reducing the attack rate from five to, say, three DMF teeth? These emotional considerations have been introduced purposely for emphasis, since they are frequently overlooked or given but scant consideration.

Another intangible factor—and a big one to which any person who has gone through a "fluoridation battle" will attest—is the ease or difficulty with which authority to fluoridate may be accorded by the governing body. If there is likelihood of a referendum or extensive litigation, it may seem difficult to justify the time expended in following through on a recommendation to increase the

fluoride content a couple of tenths of a ppm to achieve a relatively small return. The responsibility of following through is an inevitable accompaniment of such a recommendation. This responsibility may well entail hours of public education, hours of consultation, hours of technical evaluation, and, perhaps, surveys. It might seem that there are other parts of one's jurisdiction where time and emotional energy could be spent to better advantage; nonetheless, the importance of such activity should not be overlooked.

Other considerations — difficult to weigh unless one knows the specific situations to which they are applied — would be the qualifications of a waterworks staff—or the availability of adequate supervision. They must be capable (1) of determining the daily fluctuations inherent in the naturally occurring fluorides, (2) of making the daily adjustments in the amount of fluoride to be fed, and (3) of then maintaining ing the optimum level. In small communities adequately trained waterworks personnel may not be available.*

Another factor with which it is difficult to come to grips is the bearing of the community's economic status on the problem. On the one hand, a financially hard-pressed city government may not feel that it can afford for such a small return to enrich further a water supply with a considerable, but insufficient fluoride content. On the other hand, an economically depressed community will undoubtedly have a large number of dentally indigent youngsters for whom it is all the more important that every preventable cavity be prevented. Paradoxically, it would seem that a financially underprivileged city could not afford not to supplement to the optimum.

Summary and Conclusion

The following criteria should be weighed against each other when supplementation of a fluoride-bearing community water supply is under consideration:

1. The tangible benefits in terms of:
a. anticipated reduction in caries attack rate
b. anticipated increase in per cent caries free
c. anticipated reduction in dental care costs.
2. The tangible costs in capital outlay and annual operating overhead.
3. The intangible benefits, such as fewer toothaches.
4. The priorities to be considered and the intangible costs of a long, hard, time-consuming "fluoridation battle."
5. The additional problems of climate, prevalence of dental caries, number of children served, competence of waterworks operators to handle the technical complexities of minute adjustments, and the economic status of the community.

Further, tables and graphs on DMF experience at varying levels of fluoride have been presented from which to estimate roughly the anticipated reduction in the caries attack rate resulting from enrichment of fluoride-bearing waters to the optimum level.

The responsibility of the public health official is to weigh all the pertinent criteria and, together with the community officials, to reach a reasonable conclusion whether or not supplementation is advisable.

ACKNOWLEDGMENT—Grateful appreciation is expressed to the following individuals for the data (in Table 1) supplied for their respective jurisdictions: Willard Bellinger, Kansas; Frank Bull, Wisconsin; Floyd DeCamp, Florida; Robert Downs, Colorado; Charles Gillooly, Public Health Service, Region VI, Kansas City, Mo.; Charles Gish, Indiana; Harold Heinz, Nebraska; Charles Henshaw, Iowa; Orvis Hoag, Illinois;

* The paper by Scholz, Taylor, and Harris, "Experience in Maintaining Constant Fluoride Concentrations," also given at the Cleveland Meeting, and to be published in a later issue of this Journal, will provide some specific criteria for a careful evaluation of the complexities of individual situations.

Olin Hoffman, Washington; William Jordan, Minnesota; William Kroschel, Public Health Service, Region IV, Atlanta, Ga.; James Lewis, Public Health Service, Region V, Chicago, Ill.; Paul Mallinckrodt, South Dakota; George Nevitt, Public Health Service, Region IX, San Francisco, Calif.; John Peterson, North Dakota; Charles Presnell, Missouri; and to Francis Walters, Public Health Service, Region VIII, Denver, Colo.

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This paper was presented before the Dental Health Section of the American Public Health Association at the Eighty-Fifth Annual Meeting in Cleveland, Ohio, November 14, 1957.

AMA Approves Fluoridation Wholly

The House of Delegates of the American Medical Association, meeting in Philadelphia, voted in December that fluoridation of public water supplies was "not harmful to the general health" of the population. The vote followed a year-long study of the current evidence.

In 1951 the Association had given what has been called "part approval" of fluoridation in stating that it "believed" fluoridated water was "safe." This equivocal statement had been used by fluoridation opponents arguing that the Association was not ready to recommend the procedure wholeheartedly. Hence, the AMA has made its new statement backed up by a year-long study.

The maintenance of an adequate supply of dentists is one of the most serious challenges facing those concerned with the problem of dental health. How many dentists are needed? By what criteria? This paper presents a technic for answering these questions.

THE GROWING SHORTAGE OF DENTISTS IN THE UNITED STATES

Quentin M. Smith, D.D.S., M.P.H., F.A.P.H.A.

THE STORY of the United States since the end of World War II is a story of great growth and change and technical advance. Our cities are bigger, our buildings are taller, and our children are more numerous—and harder to control. Dishpan hands have been cured by the automatic dishwasher and our cars are now so long we cannot park them. Even Jello has added a couple of new delicious flavors—and perpetual motion has been discovered carrying a guitar. In short, we live in an exciting age. Today's discovery makes yesterday's miracle a commonplace—and who is to say what tomorrow will bring.

But what tomorrow will bring is a question we today would be wise to ask, and we should not ask it lightly as a tribute to our own inventiveness, but seriously, as a question basic to human welfare. More children require more schools. More cars require more highways. A new technology means a need for new technicians. Growth means change, and stimulating though it is, change can become chaos unless we are prepared for it. This is true in education. It is true in transportation and in industry. It is even more true in public health. For surely, preparation and planning in a field as vital to our welfare as health services cannot wait until tomorrow. It must begin today.

In the area of dental manpower resources today is none too soon. The fact that we have been losing ground steadily in our effort to supply needed services to our people is not new. The supply of dentists in this country has been lagging behind the growth of the population for more than a quarter of a century.

Ironically enough, this decline began as a result of a successful and much-needed effort by the dental profession to raise the educational standards of our dental schools. This occurred in the 1920's, and the subsequent closing of unaccredited and substandard schools meant a sharp decrease in dental school enrollments. Enrollments continued to fall off during the depression years and by the time World War II began we were not graduating enough dentists to replace those who died or retired.

The war ended over a decade ago. We have added new schools and increased classroom space in the old ones until today the schools are graduating nearly twice as many students as they were in the last year before the war began. And yet, the shortage has grown

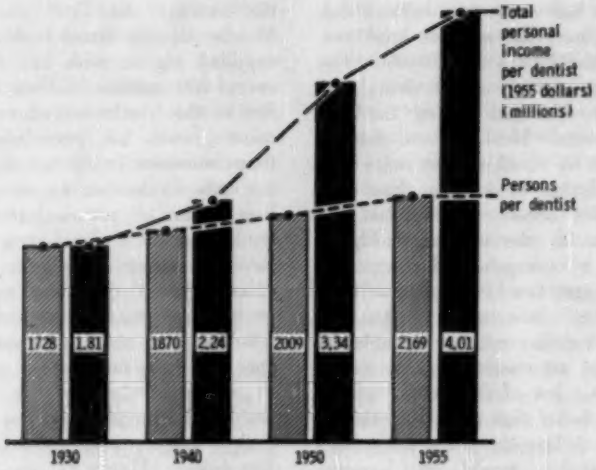

Figure 1—Dentist Supply Lags Far Behind Growth in Ability to Afford Dental Care

worse. In 1930, when there were 71,000 dentists, we had one dentist for every 1,730 people. Today with close to 80,000 practicing dentists—we have only one for every 2,170 people.*

In an age accustomed to dealing with huge figures, a 25-year increase of 400 or so in the number of persons each dentist serves sounds like a relatively small problem. Yet each time the persons-per-dentist ratio rises, the average amount of professional time available for each person is reduced and the ability of our dental force to protect the nation's oral health is threatened. And the unfortunate fact is that the amount of care available per person has been declining at the very time that the public's appreciation of good oral health has been increasing and their ability to pay for dental care growing even more rapidly.

In 1930 the nation was paying for the services of one dentist out of every 1.8 million dollars of its income (expressed in 1955 dollars) (Figure 1). By 1940 this figure had risen to 2.2 million. With the tremendous upsurge in economic well-being that accompanied and followed the war it rose again. In 1950 the nation was paying for the services of one dentist from every 3.3 million dollars of income and in 1955 from every 4.0 million dollars. In other words, where before the war we had two dentists, today we have only one in relation to the same amount of purchasing power.

Just how many additional dentists we could have right now and still assure the dentist a steady stream of patients—we do not know. It is not realistic to assume that people would buy enough dental services now to warrant having

* All dentist totals and persons-per-dentist ratios relate to active nonfederal dentists. The American Dental Association Directory provides up-to-date lists of nonfederal dentists, but includes all dentists regardless of their practice status. To eliminate dentists who have either retired or are no longer active in the profession, Directory counts have been adjusted by applying the percentage active derived from a comparison of Census data for 1950 with American Dental Association Directory materials available for the same year.

one dentist for every two million dollars of income, the support level prevailing in the 1930's and 1940's. Too many things which affect dental demands have changed during the past 10 or 20 years. Most of these changes suggest that we could support more dentists in relation to income than ever before. But others suggest that the competition for the consumer's dollar has grown a lot tougher. Larger families, the bigger tax bite, and the "buy-now-pay-later" lure which makes the purchase of such consumer durables as TV sets and air conditioners so tempting are but a few of the factors responsible for a belief that today's income is now spent differently from yesterday's —and probably would be, however many dentists we had. Consequently, earlier standards of performance are not necessarily good ones for assessing either our present or our future needs. But assess them we must if we are to plan intelligently for an orderly expansion of dental training facilities. To those in the Public Health Service concerned with manpower problems it has seemed that the most reasonable way to arrive at estimates of both the number of dentists who could be profitably at work today and the number one might reasonably expect to be in demand in the future would be to use standards based upon actual demand levels in existence today.

The differences which exist at present from state to state and from region to region in the number of dentists being supported out of identical amounts of consumer income are significant and disturbing. This situation is disturbing because the differences are so great between the most generously supplied states and regions and those least adequately supplied that unquestionably many people who want dental care do not get it—simply because they live in undermanned areas. For every 400 million dollars of personal income, the United States, on the average, has 100 dentists. The Middle Atlantic states rank as the best supplied region, with 115 dentists for every 400 million dollars of income. But in the Southwest, where recent income growth has been much greater than increases in dentist supply, there are only 73 dentists for every 400 million dollars of personal income. The South and the Great Lakes states, too, have far fewer dentists in relation to income than the national average.

On an individual state basis, the contrast is even more pronounced. The spread in the amount of income out of which we pay for the services of one dentist ranges from less than three million dollars to very nearly eight million dollars (Figure 2). In other words, the best supplied state has almost three times as many dentists in relation to purchasing power as the least well supplied state. The average state supports one dentist for every 4.3 million dollars

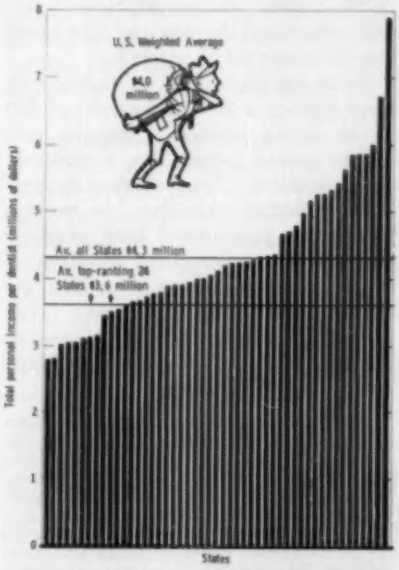
U. S. Weighted Average
94.0 million
Av. all States 84.3 million
Av. top-ranking 26 States 83.6 million
Total personal income per dentist (millions of dollars)
States

Figure 2—Effective Demand for Dental Care as Measured by Purchasing Power Available per Dentist

of income, and the 24 top-ranking states, one for every 3.6 million dollars.

In effect, but with certain qualifications to be made, the amount of income available per dentist in any state reflects the level of demand for dental services actually being met in that state today. If the amount is high, say 6 million dollars per dentist, the supply is less favorable and a relatively low level of demand is actually being met; if the amount is lower, there is a more adequate supply in relation to income and a higher level of demand is being met. For convenience then, we can think of this figure as representing a level of effective demand, and we can use it as our basic unit of measurement in arriving at estimates of current and future needs for dentists. As an example of such an estimate, if the residents of a state buy enough dental services to support one dentist for every 2.8 million dollars they earn (as is the case in two states now) then we might assume that this ratio represents the kind of relationship that would prevail between income and dentist supply in all other states if we had enough dentists to go around. This would be a risky assumption, however, for it is undoubtedly true that demand levels differ from state to state irrespective of income levels. It would be quite presumptuous to use the two most favorably supplied states as a standard for the other 46, particularly in assessing current demand. Thus we must select a more reasonable standard or standards and where possible make due allowances for factors other than income which affect demand.

Probably more often than not, the amount a state now spends on dental care is limited by the numbers of dentists available. But in the final analysis, the amount spent is determined by the people of the state—people with certain specific characteristics. A better educated population, a population more concentrated in urban areas, or one which contains relatively fewer old folks or very young people will demand more dental care out of the same amount of total income. A less well educated, more rural population, with relatively large numbers of youngsters and old people will demand fewer dental services. And so, when the statement is made that the average state is supporting one dentist for every 4.3 million dollars of personal income, we are also saying that on the average a certain number of people are pooling incomes of a given size in order to reach this figure. Among these people there are a certain number of high school graduates, a certain percentage living in towns and cities, and a certain number in age groups which purchase the most dental care. In short, any prevailing personal income per dentist figure can be thought of as representing a demand level only if it is recognized as being the expressed demand of a specific kind of population group.

It is believed that in developing estimates of manpower requirements, all of the factors mentioned—income, age composition, educational levels, and the degree of urbanization—must be taken into account. As a result, our division has devoted a great deal of time and effort over the past two years in developing an estimating technic which would not only reflect existing state-to-state differences in these characteristics, but would also take into account the future changes which are anticipated in them in each state. As our benchmarks, we have used the average state and the average among the top 24 states, and all our estimates for the present and the future are tied to the demand levels prevailing in these two hypothetical states in 1955. Furthermore, these demand levels, as previously indicated, must be seen in context—as

an economic expression of the composite character of the population living in these two average states.

To be more explicit, we first found for every state the persons-per-dentist count which would yield an income-per-dentist figure identical with that existing in the average state (4.3 million dollars) and the same was done using the figure for the average of 24 states (3.6 million dollars). To this number we applied an adjustment factor derived by comparing the characteristics of the population of each state with those of the population of the standard state. The weights assigned to various characteristics in the construction of this index necessarily represent a judgment as to the relative influence of each factor.

Using this technic, estimates have been made of the numbers of additional dentists which each region would currently need to meet the same level of demand that the average state and the average among the top 24 states are meeting.* Before presenting these estimates, however, it is advisable to review some of the ways in which individual regions differ from the two hypothetical states.

Consider educational levels as one example. Among all states, 35 per cent of the adult population have at least a high school education; among the top 24 states an average of 38 per cent have that much education. But the percentage of adults with a high school education or better varies from a high of nearly 50 per cent in the Far West and Rocky Mountain states to only 25 per cent in the South.

To take another example, 57 per cent of the residents of the average state and an average of 60 per cent of those in the 24 top-ranking states live in towns and cities, where dental services are readily accessible. In the Northeast and the Far West, however, 75 per cent or more of the population are urban residents, while in the Middle West and in the South 50 per cent or less live in towns and cities. There are comparable, though less dramatic, differences in age composition which also affect the share of income expenditures going to dental care.

Taking all of these factors into consideration, about 6,000 additional dentists would be needed to provide every region with a supply of dentists large enough to meet the demand level already being satisfied in the average state today (Figure 3). And it would take nearly 13,500 additional dentists to satisfy the demands equivalent to those being met in the top 24 states.

This latter figure is by far the more realistic estimate of our current national deficit. It is, indeed, an extremely conservative figure—being geared to levels of effective demand which are the end result of a 25-year decline in dentist supply.

The greatest immediate need for dentists is in the Great Lakes region. This region accounts for more than a third of the total national deficit. It needs about 2,400 dentists at the minimum estimated level and 4,850 at the more realistic level. In this entire region only Wisconsin and Minnesota are relatively well supplied at the present time. Ohio has the second largest deficit and Michigan the third largest of any state in the nation. Illinois ranks fifth, and Indiana, though its needs are numerically much smaller, has a relatively great shortage when these are compared with its current dentist total.

The Far West ranks next to the Great Lakes region as a shortage area, with a minimum need for 1,300 dentists and a more probable immediate need for 2,800 additional practitioners. Nearly all these dentists are required in California—the state with, by all odds, the

* All estimates of "current" need relate to 1955, the most recent year for which all necessary data are available.

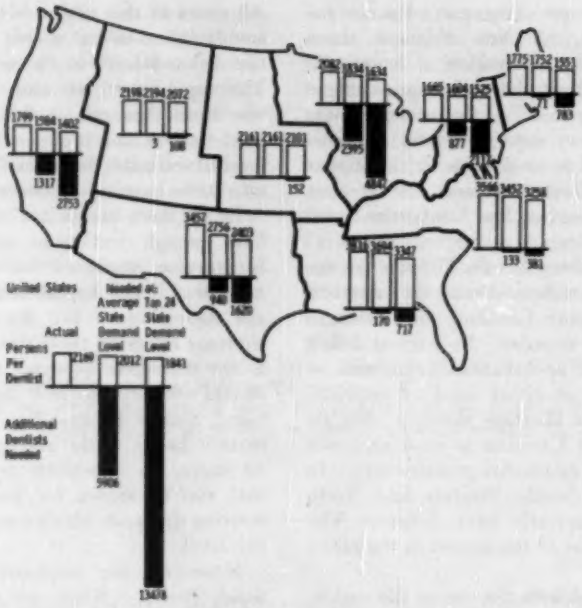

Figure 3—Current Shortage of Dentists as Measured by Levels of Effective Demand Prevailing in Average State and Average Among 24 Top-Ranking States

greatest current deficit in the nation. Oregon has no immediate shortage at either level of estimate and Washington none at the lower level, although a small deficit is indicated if the top 24 states are taken as our standard. Nevada has a small deficit in numbers but a relatively serious one for a state its size.

Two other regions, the Middle Atlantic and the Southwest, have large current deficits. The Middle Atlantic states need as a minimum about 900 dentists and, more probably, 2,100 dentists. In this region only New York and West Virginia* have no current shortage. New Jersey and Maryland are the states within the region most seriously in need of additional practitioners. The Southwest, by the two standards we are using, needs about 1,000 dentists and more realistically, an additional 1,600. The percentage increase in the supply of dentists indicated by these figures is the largest needed by any region. Texas accounts for roughly three-fourths of the total and ranks fourth among all states in the size of its current deficit. Both New Mexico and Arizona, however, have shortages of about the same seriousness, though, of course, their needs are smaller in number. Oklahoma is relatively better off than other states in the Southwest, although, in terms of numbers of dentists, it has a slightly larger deficit than either New Mexico or Arizona.

Both New England and the South

* West Virginia is, of course, a border state and shares many characteristics with both its southern neighbors and with parts of Pennsylvania. After some hesitation, we elected to include it with Pennsylvania as a part of the Middle Atlantic region, since it has come more and more to be classified with the northern bank of states for purposes of income and other economic analysis.

have moderate shortages. Except for Connecticut, all New England states have supplies of dentists at least sufficient to satisfy demands equivalent to those being met in the average state today. Every state in the region, however, needs more dentists at the higher level of effective demand, the greatest deficits occurring in Connecticut and Massachusetts.

In the Lower South, Florida has the largest immediate need for dentists. Georgia, South Carolina, and Alabama follow in that order. No current deficit is indicated in Arkansas, Louisiana, or Mississippi at either level of estimate. Of the four shortage states in this region, South Carolina is most seriously in need of additional practitioners. In the Upper South, Virginia and North Carolina currently have deficits. Virginia's is one of the largest in the entire South.

Compared with the rest of the nation, two regions—the Midwest and the Rocky Mountain states—are in good shape. In the Midwest the only two states to show any immediate needs are Kansas and Missouri, and their needs are small, existing only at the higher level of estimate. The deficit in the Rocky Mountain states is also modest. All states in this region already have a supply of dentists which could meet the demand level in the average state. The supply in Utah and Idaho could also meet demands at the top 24-state level, and at this higher, more realistic level of estimate, the other Rocky Mountain states have only moderate shortages.

In all, there are only 17 states which have enough dentists to meet demands for service equivalent to those being met today in our hypothetical high average state (Figure 4). To say that no shortage exists by these standards is not to say that these 17 states could not or should not increase their supply of dentists. Simply because our highest estimate is based on the average of the top 24 states, no immediate need for dentists can be shown for any state now meeting demands which equal or exceed this level.

Moreover, the emphasis is on the word "now." When we say that no shortage exists or that a shortage of a given size exists, we are saying only that this is the relative situation at the present time. New needs arise daily. Our dentist supply—and especially the supply of some of the states which at the moment are in relatively good shape—includes a very large proportion of

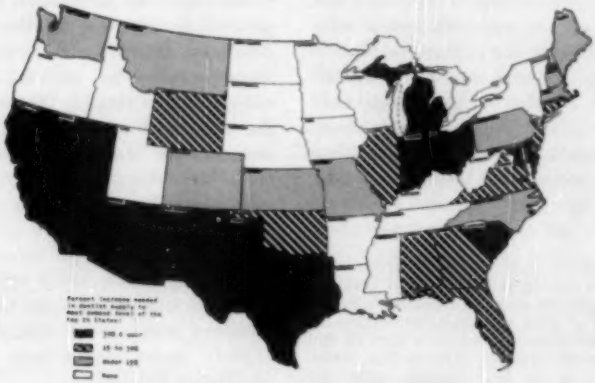

Figure 4—Relative Shortage of Dentists: 1955

older dentists who must soon be replaced. Meanwhile, the potential market for dental services is growing at a remarkable rate. Population growth is nothing short of phenomenal, incomes are climbing steadily, and a host of changes are taking place which will make dental care both more accessible and more likely to be sought in the future than it is at present.

If the demands for dental care are to be met as they arise, there is neither time nor excuse for complacency. Effective manpower planning is not the result of wishful thinking. It requires prompt and intelligent action—action based on accurate knowledge of what needs to be done. We already know much of what needs to be done. We hope that the projections of future need yet to be made on the basis of the technic presented will add to this knowledge. Certainly, continuing study by all concerned is indicated, but prolonged pondering of the problem will gain us no dentists.

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Summer Medical Library Scholarships

The Medical Library Association announces that March 1, 1958, is the closing date on which it will accept applications for eight 1958 summer scholarships in medical librarianship in four library schools. The four are the library schools of Columbia University, Emory University, University of Illinois (Urbana), and the University of Southern California (Los Angeles). Applications should be made to the library school, together with transcript of academic records, at the time of enrollment. The school then forwards the application to the Medical Library Association.

The summer scholarship stipend is $150. Satisfactory completion of the course by those who have a bachelor's degree and a degree from an approved library school qualifies a person for Grade I certification by the Medical Library Association.

Having recognized that a shortage of dental personnel exists, what can be done about it? In the December Journal, Dr. Poor described a regional approach. Here is a discussion of the role of state health departments in dealing with this problem.

DENTAL MANPOWER AND THE PUBLIC'S HEALTH: THE ROLE OF THE STATE HEALTH AGENCY

Wesley O. Young, D.M.D., M.P.H., F.A.P.H.A.

WHEN ALICE, Lewis Carroll's immortal creation, visited the land "Through the Looking Glass" she found many contradictions. Sitting down to rest after running a considerable distance she found herself under the same tree from which she had started. Nonplussed, she turned to the Red Queen who explained, "Now here, you see, it takes all the running you can do to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!" In recent years the maintenance of an adequate supply of dentists in this country has presented a problem much like that described by the Red Queen. For there are few states today which have managed to "keep in the same place" and fewer still which have been able to "get somewhere else." Indeed, "to get somewhere else"—to solve our dental manpower problem—remains, for most of us, one of the most serious challenges facing those concerned with the improvement of dental health.

The basic objective of public dental health programs is to improve the oral health of the public through organized community activities. However, with the exception of water fluoridation, almost every effective method for the improvement of dental health is dependent upon the availability of trained professional personnel—either dentists or dental hygienists. Raising the level of oral health, therefore, requires both an increase in the supply of dental personnel and the greater utilization of the available resources. Otherwise, dental care in the future may well be available to a smaller, rather than to a larger, segment of the population.

State dental health programs traditionally have been concerned with the quality of dental care provided within their jurisdiction. Unfortunately, there has not always been an equal concern for the adequacy of the supply of dental personnel available to provide care. Frequent references have been made in public health literature to the shortage of dentists. Preventive programs, such as water fluoridation, have been advocated as effective methods of reducing the demand for care and thus easing the shortage of dentists. Organized community programs to promote early and regular dental care for children also have been advocated for the same purpose. Less frequently, however, has there been any real action in regard to the most direct method of solving the problem—training more professional personnel.

Probably, this fact is not surprising.

Education in the health professions is a complicated and expensive task. The cost of building and equipping a modern dental school is enough to make any agency hesitate. Furthermore, given the physical plant, the vexing problems involved in assembling a competent teaching staff and providing operating funds impose still further hurdles. Consequently, the establishment of new facilities or the expansion of existing ones necessarily are long-term projects. Nevertheless, a state health agency which fails to concern itself with dental manpower problems is shirking its reponsibility to the public and to the profession.

The responsibility for providing an adequate supply of dentists and dental hygienists does not rest solely with the state health agency, but is shared, within the state, by the educational institutions, the dental profession, the state administration and legislature, and the public. It is evident, therefore, that successful manpower activities require cooperative action. Cooperative action involves not only official and voluntary state agencies, but as well a number of regional and national organizations, such as the American Dental Association, the Public Health Service and the regional agencies of higher education like the Southern Regional Education Board and the Western Interstate Commission for Higher Education.

The role of the state health agency in cooperative endeavors to solve manpower shortages can perhaps be outlined best by citing specific examples of action which have taken place within one region in recent years. In 1956 the Western Interstate Commission for Higher Education published a study of dental manpower requirements in the 11 western states and the territories of Alaska and Hawaii.[1] This study indicated that by 1975, if current conditions continue, the supply of dentists in the West will fall 4,000 short of the number needed merely to maintain the relative supply of dentists existing in 1955 and almost 19,000 short of the number that probably would be necessary to take care of both an expanded population and an increased demand for care. It also indicated that the western states would face a deficit of 4,000 dental hygienists by 1975. This study has served both to stimulate interest in manpower problems in the West and to provide basic data for planning on the local level. The manpower activities currently being carried on by state agencies in the western region can be summarized by considering the current situation in four states: New Mexico, Colorado, Idaho, and Nevada.

The study of dental manpower requirements in the West provided information on the needs of each state, but its primary emphasis was on the development of regional estimates of need and recommendations for action. The dental profession in New Mexico desired more specific information about its own state. The Dental Society and the Dental Division of the State Health Department, therefore, initiated a cooperative study of the supply of dentists. The State Dental Society provided the funds for the study and made arrangements for the Bureau of Business Research of the University of New Mexico to conduct the investigation. The bureau had access to social and economic information about the various areas of the state. The State Health Department supplied additional information which was tabulated, analyzed, and interpreted by the staff of the Bureau of Business Research. Results of this study will provide a guide for action in New Mexico for a number of years. Initial planning by dentists in New Mexico indicates that an effort will be made to obtain legislative appropriations to provide space for New Mexico students in a new dental school in Colorado. In addition, consideration is being given to the inauguration of a dental hygiene curriculum

in the University of New Mexico at Albuquerque.[2]

The interest in dental manpower problems in Colorado preceded the formation of the Western Interstate Commission for Higher Education by several years. The only dental schools in the West are located in the three states bordering the Pacific Ocean. More than 10 years ago dentists in Colorado became aware of the need for training facilities in the Rocky Mountain area. Preliminary studies conducted by the State Health Department and the State Dental Society confirmed the desirability of a dental school in connection with the medical school at the University of Colorado. Subsequently, a close cooperative relationship between the State Health Department and the State Dental Society has assured successful progress through the tedious steps of initial planning, arranging conferences of interested agencies, obtaining the approval of the university, soliciting public support, and finally obtaining legislative approval. More recently, the dental manpower study of the Western Interstate Commission for Higher Education helped clarify the role of the dental school in Colorado as a regional institution and provided data which made it possible to estimate enrollment which would serve not only Colorado but neighboring states such as New Mexico and Wyoming. When the proposed school opens it will be a regional facility serving the Rocky Mountain area. States without a dental school will send their students to the University of Colorado and participate, through the student exchange program of WICHE, in the cost of financing the school.[3]

The interest in dental manpower problems in Idaho also predates the WICHE regional study of dental manpower needs. In 1952 an analysis of manpower problems was conducted by the Dental Division of the State Health Department and the Public Health Committee of the Idaho State Dental Association.[4] This study showed a marked shortage of dentists, an uneven distribution of dentists that left sparsely populated and isolated areas inadequately supplied with personnel, and not one dental hygienist in practice in the entire state.

A number of agencies were involved in attacking the problem of dentist supply and distribution. The Legislative Committee of the State Dental Association worked closely with the State Medical Society and a number of other agencies in securing ratification of the Interstate Compact which allowed Idaho to join the Western Interstate Commission for Higher Education. An appropriation was secured from the Legislature to send students to dental schools in other states through the student exchange program. The State Dental Division, the Public Health Committee, and the State Board of Dental Examiners worked together to improve the methods of conducting licensure examinations and to encourage larger numbers of graduating dentists to take these examinations. The Dental Division studied the needs of various areas of the state and worked with the State Board of Dental Examiners and representatives of local dental supply companies in encouraging dentists to locate in smaller communities which were without dental service.

In order to increase the supply of dental hygienists in the state, the State Dental Society established scholarships for dental hygiene students and the Dental Division conducted an extensive recruiting program in high schools and colleges throughout the state. At the same time there was a continuous informational program designed to acquaint all practicing dentists in the state with ways of using hygienists in their practices and the advantages accruing from such employment.

In 1957 a second manpower survey

showed that, for the first time since 1920, the ratio of persons per dentist was becoming more favorable. The number of dentists in active practice had risen from 206 in 1952 to 256 in 1957. In 1952 seven of Idaho's 44 counties did not have a dentist, but in 1957 only three counties—all with a population of less than 2,000 persons—were so situated. The supply of hygienists also had shown some improvement—whereas there were no hygienists in 1952, there were six in practice in 1957.[5]

The recent state dental manpower study confirmed the findings of the regional manpower report by WICHE which indicated that Idaho's supply of dentists would be reasonably adequate to meet future needs, but that dental hygienists would be in short supply. Fortunately, the data published in the WICHE study made it possible to estimate the number of hygienists that will be needed in the state and to analyze the major problems to be overcome. This analysis indicated that the most satisfactory solution to the hygienist shortage was the establishment of a school for dental hygienists in one of the state's institutions of higher education. At the present time committees of the State Dental Association, the Dental Division of the State Health Department, faculty members of Idaho State College, and the State Board of Education are conducting a series of conferences to outline plans for a school which would offer both certificate and degree programs in dental hygiene. The proposed school would be large enough to provide adequate numbers of dental hygienists for Idaho and also to serve the surrounding states through the regional student exchange program.

A recurrent problem in dental manpower is the tendency of dentists to concentrate in urban areas leaving sparsely settled sections of the state understaffed. Frequently this can be overcome by activities to encourage dentists to locate in the areas where the need is greatest. Sometimes, however, more direct action is necessary. At least five states have established scholarship programs to assist dental students in financing their education. State scholarships in Florida, Virginia, and North Carolina are granted only to students who agree to practice in rural areas of the state for a specified period.[6] The State of Nevada, which has an extremely uneven population distribution, has attempted to solve this problem in another manner. An analysis of the manpower distribution problem by the State Dental Society and the State Health Department showed that many of the isolated areas without dental service did not have an adequate population to support a dentist. The State Dental Society provided funds to purchase a completely equipped dental trailer which travels to the isolated areas of the state. Patients utilizing the services of the mobile unit pay for dental care of the basis of current fees in the state, thereby providing sufficient funds to operate the unit.[7]

These activities in the western region have been reviewed briefly in order to indicate, by example, the type of activities that must be carried out to solve dental manpower problems and the role of the state health agency in these activities.

Four basic steps are involved in providing adequate supplies of dentists and dental hygienists. First, it is necessary to determine the present and future manpower needs and the supply of personnel available to meet these needs. Second, if the supply will not meet the expected demand, appropriate agencies must work together to organize new facilities or to expand existing ones. Third, plans should be made for the maximum utilization of existing or contemplated educational facilities both to meet the needs of the individual state and to solve regional problems through interstate cooperation. Finally, an equitable distri-

bution of dental personnel must be promoted.

The role of the state dental division in these activities can be summarized as the performance of three functions: (1) to stimulate interest and action, (2) to coordinate joint cooperative action, and (3) to serve as a source of technical information.

This role is not simple or easy. To discharge effectively the responsibilities implicit in these functions the staff of a dental division must have a keen interest in the problems of manpower supply—an interest sufficient to insure that these activities will have a high priority for time and effort. Successful coordination of joint activities requires skill in dealing with people and with the complex relations involved in bringing together many agencies which are concerned with manpower problems. The public health dentist must understand the role of each agency and be able to assist all those involved in reaching mutual understanding and agreement on a course of action. To serve as a source of technical information the personnel of a dental division must have a knowledge of all of the problems involved in providing adequate dental service to the public. This knowledge must include familiarity with national and regional trends in dental demand and the supply of personnel, since, in this modern age, no geographic unit is an entity in itself. It is also necessary to have an intimate acquaintance with the factors which determine the supply of dentists within the state, with information about present and anticipated demands for dental service, and with the characteristics of the population and the distribution of dentists.

Although the problems of dental manpower supply cannot be solved easily, it is imperative that a state health agency take an active role in manpower programs. Otherwise, it is doubtful that its over-all objective of improving the oral health of the public will be attained. The activities of the past 20 years have not been sufficient for the supply of dental manpower to "keep in the same place." It is evident that all the agencies having a responsibility and a role in the solution of manpower probems must take action—must take heed of the Red Queen's words to "run at least twice as fast"—to solve the growing shortages of dental personnel.

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How adequate are water treatment processes presently employed in dealing with pathogenic viruses? Is information obtained with bacterial virus applicable to other viruses? Recent events indicate a need for further research on these questions. This is the first of two investigations concerned with certain aspects of these problems. The second will appear in the February issue.

REMOVAL OF COXSACKIE AND BACTERIAL VIRUSES IN WATER BY FLOCCULATION

1. Removal of Coxsackie and Bacterial Viruses in Water of Known Chemical Content by Flocculation with Aluminum Sulfate or Ferric Chloride Under Various Testing Conditions

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THE ADEQUACY of modern water treatment processes in safeguarding the public from water-borne viral diseases was challenged by the recent outbreak [1] of infectious hepatitis in New Delhi, India, which presented new evidence that this disease can be spread by a water supply treated by flocculation, rapid sand filtration, and chlorination.

Quantitative information regarding the destruction of pathogenic viruses in water by chlorination is scant and that regarding their removal by flocculation is almost nonexistent. In a previous study [2] some fundamental principles in removal of bacterial virus from water by flocculation were explored. Two questions arise which require further investigation: (1) is information obtained with bacterial virus applicable to removal of pathogenic viruses?, and (2) is the information obtained with water prepared in the laboratory applicable to the treatment of raw natural waters?

The recent report of Gilcreas and Kelly [3] indicated that about 40 per cent of Coxsackie and Theiler's viruses, 85 per cent of Escherichia coli B phage, and about 90 per cent of E. coli were removed from artificially contaminated spring water by alum flocculation. Since no quantitative data were given on the turbidity of the water, the nature and amounts of viral and bacterial inocula, the buffer used, the pH of the treated water, or the amount of floc formed and turbidity removed, it is difficult to judge the removal efficiency of the flocculation process or to apply the results in practice.

This series of studies attempts, therefore, to ascertain (1) how certain pathogenic viruses differ from bacterial viruses in their behavior in the flocculation process, and (2) how efficiently current waterworks practices remove vi-

ruses and bacteria from natural surface waters. Consideration of part (1) is presented in the present report.

Materials and Procedures

Materials

Coxsackie Virus: The NIH 93 strain of Coxsackie A2 virus, prepared as a 20 per cent suspension of infected muscle tissue from suckling mice was employed as a representative enteric virus. The clarified suspension averaged 4.5 mg/ml of organic nitrogen and was stored at —70°C until used.

Bacterial Virus: The methods of producing bacteriophage against Micrococcus pyogenes var. albus and the technics of making plaque counts were described in a previous study.[4] Substitution of tryptose broth and agar for nutrient broth and tryptone agar, respectively, in the production of virus and in plates for plaque counts represents the only variation in materials. Substitution of an "HA" Millipore filter (MF) for the one described previously resulted in reduced loss of virus in the filtration process.

Glassware: All glassware with which the virus came in contact was acid cleaned, soaked in Hemo-Sol solution overnight, rinsed five times in tap water, once in distilled water, and sterilized by dry heat.

Chemicals: $Al_2(SO_4)_318 \cdot H_2O$, 5 per cent solution; $FeCl_3 \cdot 6H_2O$, 1 per cent solution; $NaHCO_3$ and HCl, 0.1M; and SiO_2, 0.5 per cent suspension were prepared from C. P. grade chemicals. The $FeCl_3$ was made up immediately prior to use as it formed a colloidal suspension on standing. Both the $FeCl_3$ and the $NaHCO_3$ solutions were sterilized by MF filtration while the rest were autoclaved at 15 pounds for 15 minutes.

Media: Peptone water, 0.1 per cent, was used for dilution of virus, and tryptose broth and agar were used for preparation of bacterial virus and for plaque count plates.

Procedures

Preparation of Test Water: Into a 600 ml beaker were pipetted 370–385 ml of sterile distilled water, 0.4 ml of SiO_2 suspension, and 3–15 ml of 0.1 $NaHCO_3$-HCl buffer solution. Volumes were calculated so that addition of bacterial and viral suspensions and flocculant in desired amounts gave a total volume of 400 ml. Volumes of buffer required to achieve a desired pH were determined by means of a control determination run without added virus.

Test Procedure: To each beaker prepared as above 1 ml of a Coxsackie virus suspension diluted to contain 250,000 LD_{50}/ml and 1 ml of a bacteriophage suspension titering 100,000–3,000,000 plaques/ml were added and a sterile glass paddle-type stirrer, connected to a stirring apparatus, was placed inside the beaker. After 15 minutes of stirring a precalculated amount of aluminum sulfate or ferric chloride was added to each of the test beakers and an equal amount of distilled water was delivered to the control beaker.

After 30 minutes of stirring with the coagulant the stirrers were removed and the floc was allowed to settle for 90 minutes. At the end of this period the supernatant fluid was sampled at one or more levels in each of the test and control beakers by means of a suction device especially made for this purpose. Samples were placed in a refrigerator and were diluted and inoculated within two to three hours after collection.

Determination of Coxsackie Virus: Threefold, or occasionally 10-fold, dilutions were made and 0.02 ml amounts were inoculated into one- to two-day old suckling mice. An average of 18 mice were used for each dilution and, on the basis of previous observations,

the range of dilutions was selected to encompass 10–90 per cent mortality. Mice were examined once or twice daily for 10 days for signs of Coxsackie infection. Mice which died within 48 hours postinoculation and starved or cannibalized litters were discarded from the experiment. Concentrations of virus were determined by constructing dilution mortality curves on log-probability graph papers and interpolating the 50 per cent mortality dilution. The reciprocal of this dilution was taken as the ID_{50} of the 0.02 ml inoculum.

Determination of Bacterial Virus: Tenfold dilutions in a predetermined range were made in sterile saline (0.85 per cent) and triplicate plates were prepared by the previously described [4] technic.

Recovery of Virus from Floc: The settled floc was transferred to centrifuge tubes and centrifuged at 2,000 rpm for 30 minutes. The sediment was suspended in 0.1 M $NaHCO_3$ to give a volume of one-tenth the original volume, i.e., 40 ml. After one hour of standing at room temperature with occasional

Table 1—Distribution of Coxsackie and Bacterial Virus in Supernatant of Settled Water After Alum Flocculation

Dosage of $Al_2(SO_4)_3$ 80 ppm
Temperature 25° C
pH 6.2–6.3 (bicarbonate buffer)
Stirring rate 81 rpm

Coxsackie

Total No. Determinations	Level at Which Supernatant Was Sampled	Dilutions Made for Inoculation	No. Infected Mice/Total No. Mice Used	Per cent of Mice Infected	LD_{50}/0.02 ml of Water *
4	Near surface	1:10	37/37	100.0	125 †
		1:100	23/40	57.4	
		1:1,000	1/38	2.7	
	Approximately 2/3 of distance from surface to bottom	1:10	30/31	96.7	110
		1:100	8/16	50.0	
		1:1,000	2/40	5.0	

* Initial concentration of virus was 4,500 LD50/0.02 ml of water.
† Approximately.

Bacterial

Total No. Plates Counted	Level at Which Supernatant Was Sampled	Mean Virus Concentration/ml Sample *	Lexis Ratio (Standard Deviation/Expected Error) †
9	Near surface	220	2.1
9	Approximately 2/3 of distance from surface to bottom	200	2.2

* Initial concentration of virus was 230,000/ml of water.

† The standard deviation was computed with the equation, $S.D.=2\sqrt{\frac{\Sigma(X-M)2}{n}}$ where X is the individual count, M is the mean count, and n is the total number of counts. The expected error was computed with the equation, $\sigma=2\sqrt{M/S}$, where M is the mean count and S is the volume in ml of water sample per plate.

mixing the suspension was recentrifuged at 2,000 rpm for 30 minutes and the supernatant fluid used for inoculation.

Organic Nitrogen Determinations: The Kjeldahl method, described in "Standard Methods for the Examination of Water, Sewage, and Industrial Wastes," tenth edition, 1955, p. 156, was used.

Experimental

Selection of Sampling Procedures: Preliminary experiments on sampling procedure, summarized in Table 1, showed that the differences in virus concentration between the two sampling levels were within the limits of experimental error. Therefore, subsequent samples were collected at a level halfway between the surface and the bottom of the supernatant fluid.

Effect of Dosage of Aluminum Sulfate: Dosages ranging from 40 to 120 ppm $Al_2(SO_4)_3$ (equivalent to 70–208 ppm of "filter" alum) were employed to compare the removal of Coxsackie and bacterial virus at varying concentrations of the coagulant.

These experiments were conducted at 25° C, pH 6.2, and at a stirring rate of 81 rpm. Bicarbonate buffer was used, unless stated otherwise, because this is the chief, if not only, buffering system present in natural surface waters and because there were indications that phosphate buffer affects removal by mechanisms other than pH.

The results of these experiments, as summarized in Tables 2 and 3, indicate

Table 2—Effect of Dosage on the Removal of Coxsackie Virus from Water by Alum Flocculation

Temperature 25° C
pH 6.2 (bicarbonate buffer)
Stirring rate 81 rpm

Sample of Water Taken	Total No. Determinations	Dilution Made for Inoculation	No. Infected Mice/Total No. Mice Used	Per cent of Mice Infected	LD_{50}/0.02 ml of Water	Per cent Removal
Before flocculation	11	1:4,500	161/325	49.5	4,500	....
		1:13,500	61/344	17.7		
		1:40,500	25/254	9.8		
After flocculation with 40 ppm alum	3	1:405	10/17	59.0	600	86.3
		1:1,215	5/19	26.3		
		1:3,645	8/45	17.7		
		1:10,935	3/43	7.0		
After flocculation with 60 ppm alum	7	1:135	68/111	61.3	200	95.5
		1:405	28/82	31.7		
		1:1,215	9/32	28.1		
After flocculation with 80 ppm alum	15	1:45	14/16	87.5	130	97.1
		1:135	118/225	52.4		
		1:405	36/167	21.6		
		1:1,215	9/197	4.6		
After flocculation with 100 ppm alum	9	1:45	17/44	38.6	30*	98.7
		1:135	23/75	30.7		
		1:405	5/87	5.7		
		1:1,215	0/19	<5.3		

* Approximately.

Table 3—Effect of Dosage on the Removal of Bacterial Virus from Water by Alum flocculation

Temperature 25° C
pH 6.2 (bicarbonate buffer)
Stirring rate 81 rpm

Dosage of Alum in ppm	No. of Experiments	Sample of Water Taken	Total No. of Plates Counted	Mean Virus Concentration/ml of Water	Per cent Removal	Lexis Ratio *
40	2	Before flocculation	4	720,000	93.5	1.9
		After "	12	72,000		2.9
	1	Before "	3	450,000		0.9
		After "	6	14,000		2.0
80	1	Before flocculation	3	1,130,000	99.1	1.4
		After "	9	10,000		1.9
	2	Before "	6	520,000		1.4
		After "	21	6,000		1.5
	2	Before "	6	51,000		1.8
		After "	24	350		0.8
100	2	Before flocculation	5	3,000,000	99.8	3.0
		After "	9	6,300		2.2
120	1	Before flocculation	3	240,000	99.8	1.3
		After "	9	590		3.9

* Computed with the same equations given in the footnote under Table 1.

that the removal of both viruses became progressively greater as alum dosage increased and that Coxsackie virus was removed at a slightly but consistently higher level than bacterial virus. The Freundlich isotherm, $R = uX^n$, was therefore employed for a quantitative interpretation of these relationships. In applying this isotherm to the present data R became the ratio of per cent virus removed to the alum dosage, X became the per cent virus remaining, and u and n were constants which depended upon the type of coagulant, the virus, and various other factors in the flocculation system.

When the values of R were plotted against those of X, respectively, on a log-log scale, two straight-line curves were obtained (Figure 1). The values of u and n were computed accordingly and found to be 0.92 and 0.32, respectively, for Coxsackie virus and 1.30 and 0.31, respectively, for bacterial virus.

It is of interest that while the values of n are almost the same for these two

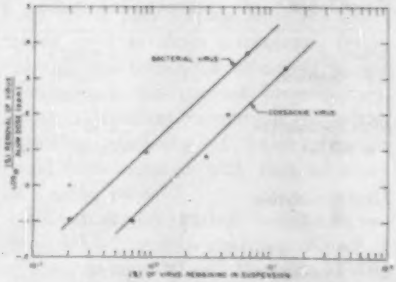

Figure 1—Linear Relationship Between the Ratio of Percentage Removal of Virus to Concentration of Alum and the Percentage of Virus Remaining in Supernatant.

viruses the value of u for the Coxsackie virus is almost one-fourth greater than that of the bacterial virus. Comparison of these values obtained for bacterial virus with those given in a previous report [2] shows that the value of u is one-third to one-half less and that of n one-third greater than were given in the former report.

It is interpreted from these comparisons that (1) while increased dosages of alum affect removal of both viruses to the same degree, the Coxsackie virus is removed at a lesser degree than is the bacterial virus, and (2) that the differences in the values of u and n computed for the bacterial virus in the two studies are attributable to the substitution of bicarbonate buffer for phosphate buffer.

Effect of pH: Levels of pH ranging from 5.5 to 8.2 were employed at a constant dosage of 80 ppm of $Al_2(SO_4)_3$ to determine the effect of hydrogen ion concentration on the flocculation process. These results, summarized in Tables 4 and 5, indicate that while the earliest floc formation occurred at pH 5.2, the optimum pH range for the removal of these viruses was 6.2–7.2.

These results differed notably from those observed in the previous study, in which the pH was regulated by a phosphate buffer, in that the earlier results showed a parallel poorer virus removal and floc formation as the pH was raised from 5.2 to 8.2. To determine whether these differences were real or apparent two experiments were conducted using phosphate buffer at pH values of 5.2, 6.2, and 7.2 in place of the bicarbonate buffer. The results were essentially the same as in the preceding study [2] and indicate that the above interpretation regarding the buffers was valid. Practically, these observations show that the optimum pH for virus removal using bicarbonate buffer was one to two units higher and that an increase above optimum pH was less critical than in the case of phosphate

Table 4—Effect of pH on the Removal of Coxsackie Virus from Water by Alum Flocculation

Dosage of $Al_2(SO_4)_3$ 80 ppm
Temperature 25° C
Stirring rate 81 rpm

Sample of Water Taken *	Total No. Determinations	Dilution Made for Inoculation	No. Infected Mice/Total No. Mice Used	Per cent of Mice Infected	LD_{50}/0.02 ml of Water	Per cent Removal
Before flocculation	11	1:4,500	161/325	49.5	4,500	....
		1:13,500	61/344	17.7		
		1:40,500	25/254	9.8		
After flocculation at pH 5.5	9	1:45	91/122	74.6	240	94.6
		1:135	74/117	63.2		
		1:405	31/82	37.8		
After flocculation at pH 6.2	13	1:135	81/170	47.6	133	97.1
		1:405	36/167	21.6		
		1:1,215	9/182	4.9		
After flocculation at pH 7.2	8	1:90	25/107	23.4	50†	99.0
		1:270	20/117	17.1		
		1:810	4/118	3.4		

* All pH values were regulated with bicarbonate buffer.
† Approximately.

Table 5—Effect of pH on the Removal of Bacterial Virus from Water by Alum Flocculation

Dosage of $Al_2(SO_4)_3$ 80 ppm
Temperature 25° C
Stirring rate 81 rpm

Final pH Value *	No. of Experiments	Sample of Water Taken	Total No. of Plates Counted	Mean Virus Concentration/ml of Water	Lexis Ratio †	Per cent Removal
5.5	2	Before flocculation	5	81,000	1.6	85.0
		After "	18	12,000	1.6	
	2	Before flocculation	6	51,000	1.8	
		After "	24	350	0.8	
6.2‡	2	Before "	6	520,000	1.4	
		After "	18	6,000	1.5	99.1
	1	Before "	3	1,130,000	1.4	
		After "	9	10,000	1.9	
	2	Before flocculation	6	189,000	1.7	
		After "	18	1,800	4.0	
7.2						97.3
	1	Before "	3	143,000	0.9	
		After "	12	6,300	3.1	
8.2	1	Before flocculation	3	81,000	0.4	
		After "	9	17,000	3.8	80.0

* All pH values were regulated with bicarbonate buffer.
† Computed with the same equations given in the footnote under Table 1.
‡ Reproduced from Table 3.

buffer. These differences in virus removal can possibly be explained by the lack of neutrality of the phosphate ion in the flocculation process.

Effect of Stirring Rate: To determine the effect of the contact rate between virus and aluminum ion upon removal of the former in the flocculation process an experiment was conducted using a stirring speed of 36 rpm. The results of this experiment, using $NaHCO_3$ buffer to give a dosage of 80 ppm of $Al_2(SO_4)_3$, were a 93.8 and a 93.6 per cent removal of Coxsackie and bacterial virus, respectively.

Compared to experiments conducted at stirring speeds of 81 rpm under otherwise identical conditions, resulting in 97.1 and 99.1 per cent removal of Coxsackie and bacterial virus, respectively, a trend toward lower efficiency at the lower speed was noted.

Removal by Ferric Chloride: Since both ferric and ferrous salts are commonly used as water coagulants, ferric chloride was tested for its virus removal efficiency in the present investigation. Being a trivalent compound the virus removing efficiency of ferric chloride could be compared with that of alum on a molar basis.

Under similar testing conditions, as those maintained in studying the effect of alum dosage, 20 and 40 ppm of $FeCl_3$ were used. The controls for determining the initial concentrations of the Coxsackie and bacterial viruses were the same as those used before. The re-

Table 6—Removal of Coxsackie Virus from Water by Flocculation with Ferric Chloride

Temperature 25°C
pH 6.2 (bicarbonate buffer)
Stirring rate 81 rpm

Coxsackie

Sample of Water Taken *	Total No. Determinations	Dilution Made for Inoculation	No. Infected Mice/Total No. Mice Used	Per cent of Mice Infected	LD_{50}/0.02 ml of Water	Per cent Removal
Before flocculation *	11	1:4,500	161/325	49.5		
		1:13,500	61/344	17.7	4,500	....
		1:40,500	25/254	9.8		
After flocculation with 20 ppm $FeCl_3$	12	1:45	57/68	83.8		
		1:135	89/163	54.6	150	96.6
		1:405	39/174	22.4		
		1:1,215	10/88	11.4		
After flocculation with 40 ppm $FeCl_3$	4	1:45	24/48	50.0		
		1:135	11/46	23.9	50	98.1
		1:405	8/65	12.3		
		1:1,215	0/43	<2.3		

* Reproduced from Table 2.

Bacterial

Dosage of $FeCl_3$ (ppm)	Sample of Water Taken	Total No. Plates Counted	Mean Virus Concentration/ml of Water	Lexis Ratio *	Per cent Removal
20	Before flocculation	3	200,000	0.6	....
	After "	6	1,500	1.3	99.3
40	Before flocculation	3	640,000	0.3	....
	After "	6	350	1.8	99.9

* Computed with the same equations given in the footnote under Table 1.

sults observed and the computed percentages of removal are presented in Table 6.

It is shown that the 20 ppm of $FeCl_3$ yielded a 96.6 and a 99.3 per cent removal of the Coxsackie and the bacterial virus, respectively. When the dosage of $FeCl_3$ was increased to 40 ppm the percentages of removal increased to 98.1 and 99.9. Since 20 and 40 ppm of $FeCl_3$ are equivalent to 0.124 and 0.248 millimol of Fe^{+++} while equal amounts of $Al_2(SO_4)_3$ are equivalent to 0.117 and 0.234 millimol of Al^{+++} ion, and since 40 ppm of the alum showed only 86.3 and 93.5 per cent removal of the viruses, respectively, it is apparent that ferric chloride is a more efficient coagulant than alum in removing these viruses from water under the conditions studied. It is also shown that the observed removal of bacterial virus was consistently greater than that of the Coxsackie virus, and that the floc formed with $FeCl_3$ was

more compact and settled more rapidly than that formed with alum.

Recovery of Coxsackie and Bacterial Viruses from Settled Floc

In the previous study [2] 11.5 and 15.2 per cent of the bacterial virus were recovered by redispersing the settled floc in water buffered at 7.6 with phosphates for two and eight hours, respectively. To determine the relative recovery of Coxsackie and bacterial viruses from settled floc in bicarbonate buffer, the floc from each beaker in four experiments (80 ppm $Al_2(SO_4)_3$ at pH 6.2) was treated as described in the section on methods. For purposes of comparison the ion-exchange resin method described by Kelly [5] was also employed in one experiment. The percentages of recovery for both viruses have been computed and are presented in Table 7, from which it is seen that recovery of bacterial virus in bicarbonate buffer was of equal magnitude from that obtained previously with a phosphate buffer, and that recovery of Coxsackie virus was much higher than that of bacterial virus. On the other hand, recovery of the bacterial virus obtained with the ion-exchange technic was less than 1 per cent and that of the Coxsackie virus, 6 per cent. Similar observations have been described [6] in relation to concentration of dilute virus suspensions.

Discussion

Treatment of water by the flocculation process has generally been successful in field application even though the complex physicochemical reactions are not completely understood. Success of the process in practice with various sources of water shows that satisfactory floc formation occurs with common coagulants under a wide range of natural conditions. However, improvement of the efficiency of the process necessitates a general understanding of its mechanism and the influencing factors. The application of experimental results to field practice requires due consideration of the physical and chemical qualities of the water concerned.

The effect of the alum dosage on the removal of both Coxsackie and bacterial viruses as observed in this study is in general agreement with prior observations on bacterial virus alone. The observations reported here indicate that Coxsackie and bacterial viruses react in a similar manner in the presence of increasing amounts of alum, but that bacterial virus appears more active and are more completely removed than Coxsackie virus. The results also indicate that an increase of two- to two and one-half-fold alum dosage produces a 10-fold decrease of virus after treatment. It will be shown in a subsequent report [7]

Table 7—Recovery of Coxsackie and Bacterial Viruses from Floc Formed with 80 ppm of Aluminum Sulfate at pH 6.2 by Redispersing the Floc in Bicarbonate Buffer at pH 8.5, and by Resinous Ion-Exchange Technic

Method of Recovery of Virus	Total No. Determinations	Per cent Recovery from Floc *	
		Coxsackie Virus	Bacterial Virus
Bicarbonate buffer at pH 8.5	12	60	10-25
Resinous ion-exchange	3	6	0-<1

* Floc obtained from virus-laden water having 4,500 LD_{50}/0.02 ml of Coxsackie virus and about 500,000 to 1,000,000/ml of bacterial virus.

that good floc formation is obtained in well buffered waters with dosages of alum as high as 360 ppm and that under appropriate conditions this dosage virus-removal relationship applies.

Because of quantitative differences observed in the removal of Coxsackie and bacterial viruses by identical dosages of alum, it appears that removal estimates based on bacterial virus will slightly overestimate the efficiency of the process for the removal of Coxsackie virus.

It has been generally considered that the optimum pH for a flocculation system is one that facilitates the earliest appearance of floc. In the light of the pH floc-formation relationship obtained in the present study it appears that if floc is formed too rapidly, the virus removal is reduced, due probably to the reduced contact of virus and metal ion.

The difference in the pH virus-removal pattern between the bicarbonate and phosphate buffer cannot be fully explained without more knowledge of the chemical reactions among the virus particles, phosphates, hydrogen and hydroxyl ion, and metal ion of the flocculant. At the present, it may be superficially stated that in the presence of a bicarbonate buffer the effect of pH is less critical than in the presence of a phosphate buffer in the removal of viruses from water by alum flocculation. Since aluminum phosphate is a relatively insoluble salt, its formation in an alum flocculation process would add to the complexity of the mechanism of floc formation.

The difference in the above removal pattern has both theoretical and practical significance. In theory, it reflects the complexity of the reactions involved in the formation of the metal-ion virus complex and its aggregate and the complication of a buffering system which exerts its effect through the anion as well as the pH. In practice, this difference stresses the caution needed in selection of a buffer for experimental studies that will yield results applicable under field conditions.

Observation on the effect of stirring rate indicates a desirability to provide maximum contact between the virus particles and the metal ion of the flocculant prior to the formation of visible floc to obtain high efficiency. Once the floc is formed the rate of stirring should, of course, be geared to obtain rapid and more complete settling of floc masses.

In comparison of virus removals obtained with alum flocculation it is seen that 40 ppm $Al_2(SO_4)_3$ in this study showed considerably higher percentage removal of both Coxsackie and bacterial virus than was obtained by Gilcreas and Kelly [3] with 28–45 ppm of the same flocculant. Because they did not describe in detail the preparation and amounts of microbial suspensions studied, the buffer used, the pH of solution, or the nature of the floc formation in the treated water, a detailed comparison of virus removal efficiencies in the two studies cannot be made. The differences in per cent removal of Coxsackie and Theiler's viruses as compared to bacterial virus removal reported by Gilcreas and Kelly were of the same pattern but of much greater magnitude than were observed in the present study.

Where virus removal is an important consideration, it appears that ferric chloride is more efficient and safer than alum in the flocculation of water because of the higher percentage virus removal and the lesser tendency of virus-floc dissociation.

Summary and Conclusion

A study has been carried out in which the efficiencies of alum and ferric chloride in removing Coxsackie and bacterial viruses by flocculation from water of known chemical nature were ascertained and the various factors that affect the virus removal efficiency of alum flocculation were evaluated. From the results obtained and analyzed in this study

the following conclusions were derived:

1. At 25° C and pH 6.2 maintained by a bicarbonate buffer, and with a stirring rate of 81 rpm, 40 ppm of $Al_2(SO_4)_3$ yielded an 86.3 per cent removal of the Coxsackie virus and a 93.5 per cent removal of the bacterial virus. Under similar testing conditions 20 and 40 ppm of $FeCl_3$ facilitated 96.6 and 99.3, and 98.1 and 99.9 per cent removal of these viruses, respectively.

2. Increase in dosage of alum resulted in a corresponding increase in per cent removal of both viruses. A log-log linear relationship existed for both viruses between the ratio of the percentage removal of virus to alum dosage and the percentage of virus remaining in the settled water. In applying the equation $R = uX^n$, where R is the former, and X is the latter, and u and n are constants, it was found that the values of u were 0.92 and 1.3, and that n values were 0.32 and 0.31 for the Coxsackie and bacterial viruses, respectively. These values indicate that while the removal pattern with increased alum dosage is very similar for these two viruses the bacterial virus is more readily removed than the Coxsackie. The dosage removal relationship suggests a two- to two and one-half-fold increase in alum dosage for every 10-fold decrease in concentration of virus remaining after treatment.

3. In the presence of bicarbonate buffer the optimum pH for the removal of both viruses by alum flocculation was in the 6.2–7.2 range. The lower removal of both viruses at pH 5.5 occurred with a more rapid appearance of the floc. At pH 8.2 a fairly good floc formation was observed and 80 per cent removal of bacterial virus was obtained. Additional observation made with 80 ppm of $Al_2(SO_4)_3$ in the presence of a phosphate buffer showed a steady reduction in virus removal with increasing pH from 5.2 to 8.2.

4. When the rate of stirring was reduced from 81–36 rpm during the flocculation period the removal of the Coxsackie and bacterial viruses with 80 ppm of $Al_2(SO_4)_3$ at 25° C and pH 6.2 (maintained with a bicarbonate buffer) was reduced from 97.1 and 99.1 to 93.6 and 93.8 per cent, respectively.

5. When the settled floc formed with alum was resuspended in a bicarbonate buffer of pH 8.5 to 9.0 and agitated for one to two hours, 60 per cent of the Coxsackie virus and 10–25 per cent of the bacterial virus could be dissociated from the floc. In a separate study attempts to separate these viruses from the floc formed with $FeCl_3$ were unsuccessful.

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A study of the prevalence of heart disease among Colorado school children turned up some interesting patterns in its distribution. These were related to several cultural and socioeconomic elements. The meaning of these findings is explored in this paper.

PREVALENCE OF HEART DISEASE IN RELATION TO SOME POPULATION CHARACTERISTICS OF COLORADO SCHOOL CHILDREN

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DURING THE period from August, 1949, to July, 1951, an extended study of heart disease prevalence in school children of Colorado was conducted under the sponsorship of the Colorado Heart Association, the Colorado State Department of Public Health, and the University of Colorado School of Medicine.

The purposes of this study were case finding and the definition of some of the epidemiologic characteristics of childhood heart disease in order that future case-finding programs could be made more specific.

Papers dealing with the methodology of the study [1] and the preliminary findings as to prevalence of heart disease [2] have already been published.

In brief, the study covered two groups of children. The principal or "regular" group was confined to sixth grade children enrolled in school. The second or "extra" group was made up of children not in the regular group but about whom there was some concern regarding the possibility of heart disease.

The study covered 41 of Colorado's 63 counties. These 41 counties have 89 per cent of the total population of the state and 83 per cent of all the sixth grade school children. It is estimated that the "regular" sample of this study represents 62 per cent of the total number of sixth graders of the state.

Data were collected on 11,236 "regulars" and 1,705 "extras." The data included information secured by questionnaire and from cardiac examination. The examinations were done by teams of physicians thoroughly versed and long experienced in pediatric cardiology. There was agreement among the examiners as to the criteria of diagnosis, they were those recommended by the American Heart Association, but applied conservatively.

Preliminary analysis of the data suggested that the prevalence of definite heart disease was greater among: (1) Spanish Americans than Anglo Americans; (2) rural residents than urban residents; and (3) those who live in crowded homes than those who live under lesser conditions of crowding. The present paper is concerned with an analysis of meaning of these apparent differences.

Preliminary analysis showed no suggestive patterns or apparent differences in heart disease prevalence in relation to: county of residence at the time of study, geographic area of the state, length of residence in the county, median 1949 family income for the counties studied. The relationship of altitude to the incidence of rheumatic fever and rheumatic heart disease has long been a subject of speculation. The findings of the present study do not show any differences in the prevalence of established rheumatic heart disease that can be related to altitude. An attempt was made to relate the prevalence of heart disease to other forms of crowding such as crowding in the sleeping quarters of the home and crowding in the school bus but the data were insufficient to justify any conclusions.

The term "prevalence" is used in its accepted epidemiologic sense, the accumulated amount of a disease found in the population under study at a specified instant in time, without regard to the date of onset of the disease. None of the statistics to follow should be construed to mean "incidence" or the amount of newly developed disease in a specified elapsed period of observation.

Method

For purposes of the present paper, certain exclusions were made. Only the "regular" sample or sixth graders will be considered; the "extra" group is a highly selected one not representative of the population. From the regular group of 11,236 are excluded 200 individuals belonging to racial or ethnic groups other than Anglo or Spanish Americans and 88 individuals for whom age, sex, or place of residence were not stated or who were not examined. In so doing, two cases of definite heart disease were also excluded, the prevalence ratio among the excluded being eight per 1,000 as compared with 9.6 per 1,000 for the group to be considered in the remainder of this paper. The exclusions amount to 2.5 per cent of the total sixth graders.

For the 10,948 sixth graders remaining for detailed analysis, the principal observation to be explored is that of differences in prevalence of definite heart disease between the Spanish-American and Anglo-American children. This variable may be considered one of racial or ethnic group difference in part, but essentially it deals with the two major cultural groups in Colorado.

Because of known differences in distribution of these two population groups in relation to the other important variables, the use of standardized prevalence was necessary. Prevalence ratios for heart disease (rheumatic, congenital, and total) standardized simultaneously for sex, age, index of crowding in the home, and size of community of residence were developed. The method of standardization used was that of computing the number of cases of heart disease to be "expected," if both groups were to have the same distribution in respect to the four variables. The "expected" number of cases divided by the population at risk and multiplied by a suitable factor gives the adjusted or standardized prevalence ratio.

Table 1 summarizes the findings in terms of population at risk and cases (both observed and expected) which are the basis for the subsequent tables of prevalence ratios. Potential rheumatic heart disease and suspected heart disease of any type are not considered in this paper.

Table 1 shows that of the 10,948 children under consideration there were 105 who had heart disease sufficiently typical to be called clinically definite. There were 75 who had rheumatic and 31 who had congenital heart disease. One individual had both types and is counted in each subgroup but is counted only once in the total group. This fact

accounts for the apparent discrepancies between the total and the sum of the two subgroups in parts of all of the tables.

The changes in over-all prevalence ratios resulting from standardization can be shown simply as follows:

	Prevalence Ratios (Cases of Definite Heart Disease per 1,000 Examined)		
	Spanish	Anglo	Difference
Total with heart disease			
Observed	13.93	8.61	5.32
Standardized	13.53	8.70	4.83
Rheumatic heart disease			
Observed	10.45	6.04	4.41
Standardized	10.15	6.11	4.04
Congenital heart disease			
Observed	3.48	2.68	0.80
Standardized	3.53	2.67	0.86

The process of making the two cultural groups comparable as to the four variables decreases the differences between their prevalence ratios chiefly for rheumatic heart disease and, by extension, total heart disease. The differences in prevalence between the Spanish and Anglos are not statistically significant.

Prevalence ratios showing the differences between the Anglo and Spanish groups as related to sex are shown in Table 2.

Table 2 shows that the Spanish Americans have consistently higher prevalence ratios than do their Anglo counterparts. There are differences related to sex, Spanish males having lower prevalence of both types of heart disease than Spanish females, while the reverse is true for Anglos. For both cultural groups taken together, males have slightly higher prevalence than females and the greatest difference between the sexes is in prevalence of congenital heart disease. None of the differences can be considered statistically significant.

One of the major differences between the two cultural groups is that of age distribution. Spanish Americans do not have the same incentive toward participating in organized educational programs as do the Anglo Americans. It is to be expected that among sixth graders, the Spanish American will on the average be older. From the data in Table 1 it can be shown that 69 per cent of the Spanish Americans in the group being considered here were 12 years of age or older at the time of study, whereas only 34 per cent of the Anglos were in the same age category. Since rheumatic heart disease tends to be cumulative with age, that is to show increasing prevalence with increasing age, the age difference between the two groups was the chief reason for standardizing prevalence ratios.

Prevalence ratios by age and cultural group are shown in Table 3.

It will be seen from Table 3 that in general the prevalence ratios increase with age and that the Spanish have the highest prevalence ratios in the two oldest age groups for rheumatic and for total heart disease. The inconsistencies in the ratios for congenital heart disease may be due to sampling variation related to small numbers of cases.

The fact that the Spanish have lower prevalence ratios in the age group 11

Table 1—Number Examined and Number of Observed and Expected * Cases of Definite Heart Disease in Spanish- and Anglo-American Sixth Grade School Children Distributed by Sex, Age, Index of Crowding in the Home, and Size of Community of Residence; Colorado, 1949–1951

Factor or Variable	Number Examined (Population at Risk)	Cases of Definite Heart Disease					
		Total		Rheumatic		Congenital	
		Observed	Expected	Observed	Expected	Observed	Expected
Sex							
Male	5,645	56	56.0	39	39.0	17	17.0
Spanish	1,005	13	12.9	8	9.5	5	3.4
Anglo	4,640	43	43.1	31	29.5	12	13.6
Female	5,303	49	49.0	36	36.0	14	14.0
Spanish	1,005	15	14.3	13	10.8	2	3.7
Anglo	4,298	34	34.7	23	25.2	12	10.3
Age							
11 years or less	6,496	47	47.0	33	33.0	14	14.0
Spanish	606	6	3.9	4	2.7	2	1.1
Anglo	5,890	41	43.2	29	30.3	12	12.9
12 years	3,305	35	35.0	24	24.0	12	12.0
Spanish	901	10	9.3	8	7.1	2	2.5
Anglo	2,504	25	25.7	16	16.9	10	9.5
13 years or more	1,147	23	23.0	18	18.0	5	5.0
Spanish	604	12	14.0	9	10.5	3	3.5
Anglo	544	11	9.0	9	7.5	2	1.5
Crowding as Persons per Room							
1.00 or less	4,210	27	27.0	13	13.0	14	14.0
Spanish	235	1	1.9	1	0.9	0	0.9
Anglo	3,975	26	25.2	12	12.1	14	13.1
1.01–2.00	4,654	52	52.0	42	42.0	11	11.0
Spanish	818	11	11.3	8	9.3	3	2.3
Anglo	3,836	41	40.7	34	32.7	8	8.7
2.01 or more	1,349	16	16.0	11	11.0	5	5.0
Spanish	721	13	10.5	9	7.3	4	3.1
Anglo	619	3	5.5	2	3.1	1	1.9
Not stated	744	10	10.0	9	9.0	1	1.0
Spanish	236	3	3.6	3	2.8	0	0.8
Anglo	508	7	6.4	6	6.2	1	0.2
Size of Community							
Rural-farm	3,193	34	34.0	25	25.0	9	9.0
Spanish	537	7	9.5	6	6.6	1	2.8
Anglo	2,656	27	24.5	19	18.4	8	6.2
Rural-nonfarm	2,389	23	23.0	15	15.0	9	9.0
Spanish	468	8	6.8	5	4.5	3	2.5
Anglo	1,941	15	16.2	10	10.5	6	6.5
Urban	5,446	48	48.0	35	35.0	13	13.0
Spanish	1,005	13	11.0	10	9.2	3	1.8
Anglo	4,441	35	37.0	25	25.8	10	11.2
All Factors	10,948	105	105.0	75	75.0	31	31.0
Spanish	2,010	28	27.3	21	20.4	7	7.1
Anglo	8,938	77	77.8	54	54.6	24	23.9

* Expected numbers are derived by the simultaneous standardization for differences in distribution as to the major variables.

NOTE: there was one individual with both rheumatic and congenital heart disease who was counted for each type but only once in the total heart disease category.

years or younger may be an artifact due to the limitation of the study to sixth graders.

At the inception of the study it was felt that some information should be gathered as to the conditions under which the child lives at home. This would serve as a very rough index of socioeconomic status and, if considered in terms of crowding, would give some clue to the opportunities for exchange of infectious agents. A questionnaire

Table 2—Standardized * Sex-Specific Prevalence Ratios of Definite Heart Disease in Spanish- and Anglo-American Sixth Grade School Children, Colorado, 1949–1951

Culture Group	Individuals With Definite Heart Disease per 1,000 Sixth Graders Examined		
	Male	Female	Both Sexes
	Total Heart Disease		
Spanish	12.8	14.2	13.5
Anglo	9.3	8.1	8.7
Both	9.9	9.2	9.6
	Rheumatic Heart Disease		
Spanish	9.5	10.8	10.1
Anglo	6.3	5.9	6.1
Both	6.9	6.8	6.8
	Congenital Heart Disease		
Spanish	3.4	3.7	3.5
Anglo	2.9	2.4	2.7
Both	3.0	2.6	2.8

* Standardized for age, index of crowding in the home, and size of community of residence.

Table 3—Standardized * Age-Specific Prevalence Ratios of Definite Heart Disease in Spanish- and Anglo-American Sixth Grade School Children, Colorado, 1949–1951

Cultural Group	Individuals With Definite Heart Disease per 1,000 Sixth Graders Examined			
	11 Years or Less	12 Years of Age	13 Years or More	All Ages
		Total Heart Disease		
Spanish	6.4	11.7	23.2	13.5
Anglo	7.3	10.2	16.5	8.7
Both	7.2	10.6	20.0	9.6
		Rheumatic Heart Disease		
Spanish	4.5	8.9	17.4	10.1
Anglo	5.1	6.8	13.7	6.1
Both	5.1	7.3	15.7	6.8
		Congenital Heart Disease		
Spanish	1.9	3.1	5.8	3.5
Anglo	2.2	3.8	2.8	2.7
Both	2.2	3.6	4.4	2.8

* Standardized for sex, index of crowding in the home, and size of community of residence.

was used for this purpose. Inquiry was made as to the number of rooms in the home and the number of persons occupying the home. In addition, there were included questions designed to give some measure of crowding in the room in which the child slept. For the latter questions the information obtained appeared to have little validity. On the first question, answers were fairly straightforward so that it was felt that an approximate measure of crowding in the home, as a totality, was gained for those who responded.

The relationship of crowding to heart disease prevalence is given in Table 4.

Crowding was expressed as an index, the number of persons per room, in each child's home. There is no solid agreement as to what distinguishes crowding from not-crowding, although the figure 1.5 persons per room is sometimes used as an arbitrary dividing line.

For the purposes of this paper only broad categories could be used. In addition there were many nonrespondents to the questions on crowding. Of the Spanish-American group 12 per cent did not respond as compared with 6 per cent of the Anglo group. Of those who did respond, 41 per cent of the Spanish group children lived under conditions of two or more persons per room whereas only 7 per cent of Anglo children lived under corresponding conditions.

No clear-cut relationship is seen in Table 4, except that of both cultural groups combined to total heart disease. The high prevalence rates in the nonrespondents (not-stated category) is a mark of the unreliability of the data.

The only positive statement that can be made is that those children who live in homes with a crowding index of one or fewer persons per room showed

Table 4—Standardized * Prevalence Ratios of Definite Heart Disease, Specific for Indexes of Crowding in the Home, in Spanish- and Anglo-American Sixth Grade School Children, Colorado, 1949–1951

Cultural Group	Individuals With Definite Heart Disease per 1,000 Sixth Graders Examined				
	Persons per Room Index				
	1.00 or Less	1.01–2.00	2.01 or More	Not Stated	All Indexes
	Total Heart Disease				
Spanish	7.8	13.8	14.5	15.2	13.5
Anglo	6.3	10.6	9.0	12.5	8.7
Both	6.4	11.2	12.0	13.4	9.6
	Rheumatic Heart Disease				
Spanish	3.9	11.3	10.2	11.9	10.1
Anglo	3.0	8.5	5.9	12.1	6.1
Both	3.1	9.0	8.2	12.0	6.8
	Congenital Heart Disease				
Spanish	3.9	2.8	4.3	3.3	3.5
Anglo	3.3	2.3	3.0	0.4	2.7
Both	3.3	2.4	3.7	1.3	2.8

* Standardized for sex, age, and size of community of residence.

Table 5—Standardized * Prevalence Ratios of Definite Heart Disease, Specific for Size of Community of Residence, in Spanish- and Anglo-American Sixth Grade School Children, Colorado, 1949–1951

Cultural Group	Individuals With Definite Heart Disease per 1,000 Sixth Graders Examined			
	Rural-farm	Rural-nonfarm	Urban	All Places
		Total Heart Disease		
Spanish	17.6	14.4	10.9	13.5
Anglo	9.2	8.8	8.3	8.7
Both	10.6	10.0	8.8	9.6
		Rheumatic Heart Disease		
Spanish	12.3	9.6	9.2	10.1
Anglo	6.9	5.7	5.8	6.1
Both	7.8	6.5	6.4	6.8
		Congenital Heart Disease		
Spanish	5.2	5.3	1.8	3.5
Anglo	2.3	3.5	2.5	2.7
Both	2.8	3.9	2.4	2.8

* Standardized for sex, age, and index of crowding in the home.

the lowest prevalence of rheumatic heart disease.

For purposes of assessing the relationship of heart disease prevalence to size of community of residence, each child was classified as to one of three categories: rural-farm, those living on farms or ranches; rural-nonfarm, those living in towns with less than 2,500 population or in unincorporated suburbs of the major population centers; and urban, those living in organized communities of 2,500 or more population. The two cultural groups show no appreciable difference in distribution of numbers among the three categories of community size.

The prevalence ratios of heart disease in relation to size of community are given in Table 5.

Despite some inconsistency there appears to be somewhat higher prevalence of heart disease in sixth graders living in the rural setting than among urban dwellers. The greatest differences are among the Spanish Americans. The Anglo Americans show much more consistency.

Discussion

Detailed analysis of the data tends to support the original impressions.

The important difference in heart disease prevalence is that which exists between the two major cultural groups. Although this difference is influenced by a number of different factors, it remains when adjustment is made to compensate for differences in other measurable characteristics. Furthermore, although the higher heart disease prevalence ratio in Spanish Americans is not significantly greater in the statistical sense than that of the Anglo American, the consistency of the difference argues that it is real rather than apparent.

At the time the study was begun it was thought that Anglo and Spanish Americans would have approximately

equivalent prevalence ratios for congenital heart disease. The fact that the Spanish-American sixth graders showed a higher prevalence ratio for congenital heart disease than did the Anglos was something of a surprise. However, the differences between the two groups as to congenital heart disease are neither as great nor as consistent as the differences in rheumatic heart disease prevalence. One can argue that the differences in congenital heart disease prevalence between the two cultural groups are likely apparent rather than real and due to sampling variation. On the other hand, it is conceivable that cultural and socioeconomic differences may actually predispose the Spanish Americans to greater risk of congenital heart disease than that of the Anglos. By contrast to the Anglos, the Spanish-speaking Coloradoans have less opportunity and incentive for good prenatal care, less adequate nutrition, more crowding and greater opportunity for maternal and, subsequently, fetal infection.

The conspicuous difference, then, between the Anglos and Spanish is that of prevalence of rheumatic heart disease. It is best explained on cultural or socioeconomic grounds. There may be genetic factors operating but at the present time we have no clues which would suggest their possibility.

Summary

This study is concerned with the prevalence of heart disease in 10,948 children enrolled in the sixth grade of schools in 41 Colorado counties during the period of 1949–1951.

This group included 2,010 Spanish-American and 8,938 Anglo-American children. Other ethnic groups were too small in number for consideration here.

The over-all or general prevalence ratio for clinically definite heart disease was 9.6 per 1,000 children examined. This figure was made up of 6.8 cases of rheumatic heart disease and 2.8 cases of congenital heart disease per 1,000.

The most striking finding was the difference in heart disease prevalence between the two major ethnic or cultural groups. The Spanish-American children had a general prevalence ratio of 13.9 cases per 1,000 as contrasted with 8.6 for the Anglo Americans. The difference was more conspicuous for rheumatic heart disease than for congenital heart disease.

On standardization or adjustment of ratio to make the two groups comparable as to distribution by sex, age, crowding in the home, and size of community of residence, the difference between the Spanish and the Anglos was reduced but not wiped out. The standardized prevalence ratios were 13.5 and 8.7, respectively. The difference between the two standardized ratios is not statistically significant ($P = 0.10$ to 0.05).

Most of the difference in prevalence of heart disease between the two groups is related to rheumatic heart disease. So consistent is the evidence that it is believed that the difference is real so far as rheumatic heart disease is concerned.

Differences between the two groups as to the frequency of congenital heart disease are small and less consistent. The differences are probably not meaningful although there are some grounds for speculation as to possibility of greater risk of congenital heart disease in the Spanish as compared to the Anglos.

Differences in the prevalence of heart disease as related to sex were observed. Spanish females had somewhat more heart disease than males, but the reverse was seen in the Anglos.

It is shown that the prevalence of rheumatic and congenital heart disease is greater among rural than urban dwellers, in Colorado, and, though the data is of less reliability, there is an indication that those living under home conditions of little crowding are at lesser

risk of childhood types of heart disease than are those who live under crowded conditions.

It is felt that all of the differences in heart disease prevalence demonstrated in this study are best explained on the basis of environmental factors that are cultural or socioeconomic in nature. Genetic factors cannot be ruled out but there are no grounds, as seen in this study, for considering them seriously.

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New York's 18th County Department

Dutchess County on January 1, 1958, became the 18th of New York's 57 upstate counties to set up a county health department. Twelve of these have been organized since the 1946 revision of the state public health law by which an organized county receives 75 per cent reimbursement for the first $100,000 of health expenditures and 50 per cent of expenditures beyond that figure.

Services in the county have heretofore been provided by a state district office which has now been closed. Beacon, with a population of about 14,000, has elected to continue its own department headed by a part-time health officer. The county department thus serves a population of about 125,000. The 18 counties now organized have half of the upstate population.

This report considers the uses and quality of medical returns on death certificates. The purpose of the review is to see how cause of death statistics can be improved. Recommendations are made for studies to achieve this aim.

PROBLEMS IN THE MEDICAL CERTIFICATION OF CAUSES OF DEATH

Committee on Medical Certification of Causes of Death—Statistics Section

THIS REPORT considers first the purposes served by medical returns on death certificates and reviews briefly some earlier investigations of the quality of these returns. The report then proceeds to a discussion of current problems and concludes with recommendations for studies to develop and improve cause-of-death statistics.*

Purposes Served by Medical Returns on the Death Certificate

To orient the work of the committee, consideration was first given to the major purposes served by the medical returns on death certificates. These may be classified briefly as follows:

1. Medicolegal

The Uniform Vital Statistics Act of 1942 stipulates that the physician who last attended the deceased is to state the cause of death on the death certificate. In the following circumstances, this responsibility is given to an established medicolegal authority, such as the coroner or medical examiner, in practically every state:[1]

a. the deceased had not received medical attention

b. the identity of the deceased or the cause of death is unknown

c. violence was involved or suspected.

It is estimated that the coroner or medical examiner functions in about 20 to 25 per cent of the registered deaths.

2. General Public Health Uses

By means of the statement of cause of death, the local or state health department is better enabled to meet the legal requirements imposed upon it, including those for the compilation and publication of its mortality experience. These data also serve as bases for public health and public assistance programs.

3. Locate Cases for Clinical Investigations

Extensive use has been made of individual death certificates for clinical studies on infant deaths, certain communicable diseases, and other disease conditions. Among the many examples that may be cited, mention may be made at this point only of those of the county medical societies in New York City on

* Recommendations on other phases of mortality statistics are presented in National Vital Statistics Needs, A Report of the United States National Committee on Vital and Health Statistics. Vital Statistics—Special Reports 45:214 (July 17), 1957.

the basis of cases turned up in the files of the Health Department.[2]

4. Follow-Back Studies

In these studies, the certificates with some specified cause of death, for example, cancer of the lung, form the starting point for investigations in which each case is traced back for further information from the hospital, clinic, attending physicians, the family, and other pertinent sources. The collected detail is then studied for medical, environmental, or genetic clues related to the known morbid conditions.[3]

5. Supplying End Points to Studies

In most follow-up studies of cases with some specific morbid condition, the causes of death are generally important in interpreting results. Examples of such studies are those based upon rosters (cohort) of individuals in official disease registers, such as those for cancer and tuberculosis, and upon clinical and insurance records of persons with various diseases or physical impairments.[4]

6. Insurance Uses

In the payment of life insurance claims, the statement of cause of death on the certificate is used by the beneficiary when accidental death benefits may be involved. In this circumstance, the insurance company will also be concerned with the statement of cause of death. Another instance of concern to the insurance company is the case where the certificate indicates misrepresentation at the time of application, or suicide as the cause of death within the exclusion period.

7. Demographic Analyses

Analyses of mortality according to cause of death have been used in studies of characteristics and trends in social and economic conditions of communities.[5] In one approach to making projections of mortality, trends of death rates from specific causes were studied with regard to age, sex, and race.[6]

8. General

The committee made no effort to ascertain what kinds of statistics were needed by the various consumers of cause of death data. The scope and detail of the cause of death data to be produced require constant consultation between the producers and consumers in order to meet new and changing needs. This introduces problems in devising a means of learning who the consumers are, of defining and crystallizing their needs in specific terms, and also of satisfying requests made for cause of death data.

Studies of Quality of Statement of Cause of Death

A number of studies, noted in the appended bibliography, have been made concerning the accuracy of medical diagnosis and the quality of statements of cause of death. Some of these studies, such as those of Jackson, Cabot, and Lewis, deal only with problems of accuracy of clinical diagnoses whereas the studies relating to accuracy of medical certifications of causes of death generally involve precision of diagnoses as well as the accuracy of causes of death reported on the death certificates.

The various studies may be classified under the following headings:*

1. summaries of autopsy findings on patients with a specific clinically diagnosed condition: (a) relating the clinical observations with subsequent autopsy findings to improve clinical diagnosis (1, 7); (b) relating clinical diagnosis with autopsy findings to measure and describe diagnostic error (6, 13);

2. summaries of autopsy findings in general compared with clinical diagnoses to measure

* The numbers inside parentheses are keyed to the appended Select Bibliography.

and describe areas of clinical diagnostic error (2, 4, 9, 10);

3. studies of temporal changes in the level of mortality from a particular disease where the investigator is faced with the problem of separating real changes from the false, i.e., resulting from improvement in accuracy of diagnosis (3);

4. summaries of the accuracy of medical certifications on death certificate: (a) quality of medical certifications of death and accuracy of recording clinical data (5, 11, 12); (b) comparisons of autopsy findings in general with medical certifications of death (14, 16); (c) completeness of reporting of conditions associated with social stigma; effect of increased confidentiality (8, 15).

Most of the evaluations of cause-of-death statements are comparisons between entries on death certificates and clinical records and/or autopsy protocols. Because of the selection involved in comparisons between death certificates and hospital records or autopsy reports, it is difficult to generalize from these studies. However, it is apparent that for some causes of death there are considerable inaccuracies in the medical statements because of failures to diagnose accurately or because of inadequacies of reporting. It is difficult to separate these two sources of error. Attaining accurate clinical and pathologic diagnoses are medical problems which will always be present. On the other hand, it should be possible to secure significant improvement in the quality of medical certification.

Current Problems and Recommendations

The statistics on causes of death are based on medical statements which are further influenced by the statistical concept of cause of death, the facts available to the certifying physician, the manner in which the medical information is reported, and the existing disease classification system and the classification procedures.[7]

The committee has considered the more important problems deserving study for the purpose of improving the utility of cause-of-death statistics and makes a number of recommendations.

1. The "Underlying Cause" Concept

The selection of a single cause to which a death is attributed has been traditional in cause-of-death statistics. The cause selected for primary tabulation is the "underlying" cause, which is the disease or injury that initiated the train of events leading to death. The underlying cause concept has had considerable utility from the public health point of view. However, the cause of death selected for primary tabulation is frequently not the disease that started the train of events leading to death because the etiologic factor is not known or cannot be determined. In other instances, the underlying cause may be known but not reported.

When there is only a single disease involved in the death, there is no problem. However, for a large number of deaths, particularly those resulting from chronic conditions, the underlying cause may be inadequate. In the first place, it is not always possible to single out the sequence of related diseases and conditions from a complex of conditions which frequently occurs, for example, in cardiovascular disease. Second, for the study of chronic disease there is some question as to whether the underlying cause is as useful as a classification identifying disease complexes. For example, in a study of a sample of 729 death certificates for one month for New York City on which two causes of death were reported, one being coronary heart disease, the following distributions were found: the proportion of males was 43 per cent where hypertension was reported with coronary disease, 43 per cent where diabetes was the associated cause, and 66 per cent where all other causes were associated.

The age distributions, in per cent of the total sample of deaths involving coronary heart disease as one of two causes, were as follows:

	25–45 Years	45–64 Years	65 Years and Over
Total sample	2	38	60
Coronary disease with diabetes or hypertension	2	52	46
Coronary disease with hypertension	2	49	49
Coronary disease with diabetes	4	61	35
Coronary disease with other diseases	2	36	62

The variations in the sex ratios and age distributions indicate that the deaths that would be attributed to coronary heart disease under the underlying cause principle are comprised of several heterogeneous categories of deaths. In this situation, a disease-complex type of classification or an associated cause tabulation would yield more discriminating data than a single cause classification.

There is also some philosophic objection to attributing a death to a single cause when it is obvious that death may not have or would not have occurred without the intervention of other diseases.[8] However, it would not be practicable to characterize each death for statistical tabulation by all the diseases and complications involved. Here again, a feasible approach to the solution of the problem is to develop more fully than has the Sixth Revision a disease-complex type of classification and/or to provide multiple cause tabulations to cross-tabulate associated diseases and conditions.

2. The Statistical Classification of Diseases

The statistical classification in current use is the Sixth Revision of the International List of Diseases and Causes of Death. This revision represents a considerable expansion over the previous International Lists of Causes of Death since it attempts, among other things, to meet the needs for classifying causes of illness. The Seventh Revision which has been adopted for use in 1958 is not significantly different in content from that of the Sixth Revision.

It has been recognized from its very adoption that the Sixth Revision of the International Lists of Diseases and Causes of Death was inadequate with respect to certain disease categories. At least two major sections, those relating to Mental, Psychoneurotic, and Personality Disorders and to the Diseases of the Circulatory System have not been satisfactory.

It is expected that the Eighth Revision of the International Lists of Diseases and Causes of Death in 1965 will provide an opportunity for a sweeping revision. It is not too early to undertake studies preparatory to submission of recommendations for the Eighth Revision. Therefore, the committee recommends that the classification be thoroughly reviewed from the standpoint of providing, wherever possible and appropriate, categories for the identification of significant disease-complexes.[9]

3. Tabulation of Multiple Causes of Death

It is recognized that it will not be possible or desirable to provide specific categories for all known combinations of diseases in a statistical classification. However, by tabulating multiple causes of death it becomes possible to study the relative frequency of various combinations of diseases. Such a tabulation may also be used to show an association between disease and disease complexes. Also by this means, it will be possible to utilize medical information which would otherwise be lost in single cause tabulations.

There are a number of important unsolved problems involved in the prep-

aration of multiple cause tabulations. Some of these are as follows:

a. A satisfactory description of the specific disease categories to be classified for the desired statistical purposes.

b. The use of the present medical certificate form which is designed specifically to obtain information on the underlying cause. This may be a limiting factor in obtaining data needed for such tabulations.

c. Use of the International Lists of Diseases and Causes of Death which are devised for single rather than for multiple cause tabulations.

d. Determination of associations between diseases to be shown in multiple cause tabulations.

e. Development of procedures and methods to tabulate and present data.

It is recommended that all of these problems be studied. In particular, there is need to determine the kind of multiple cause statistics that would be most useful. Consideration should be given to the possibility of conducting special studies on multiple causes of death by collecting data in addition to what are now reported on death certificates. Because of the problems and the cost involved in producing multiple cause tabulations, such tabulations should not be undertaken lightly or as a routine function.

4. Changing Medical Concepts

The state of medical knowledge imposes a limitation on the physician in the diagnosis of disease. With increasing medical knowledge, concepts of diseases change. Also, from time to time, medical opinion is influenced by particular attention given to certain findings and excessive reporting in such directions may result. Accordingly, at any one time, mortality statistics must reflect the average clinical opinion of the certifiers.

Changes in medical concepts are reflected in mortality statistics in varying degrees. For example, coronary disease was an unknown diagnostic entity until Herrick first described the clinical manifestations of acute coronary occlusion (1912). From the 1920's, mortality from coronary diseases has been reported with increasing frequency. Today, they constitute one of the most common causes of death.

Another example of changing medical concepts relates to the diagnosis of primary lung cancer. Bronchogenic cancer was considered to be an uncommon disease entity about 30 years ago. The classification procedures reflected this state of medical knowledge by giving very little weight to lung cancer unless specified as primary. However, it now appears that reported lung cancer is generally primary unless specified to be a metastic site.

There is also the problem of divided medical opinion on relationships between particular diseases. An excellent example is that between diabetes and the cardiovascular diseases. While it has been established from analysis of clinical records that cardiovascular degeneration begins earlier and progresses faster in diabetics than in nondiabetics, there are differences of opinion whether diabetes causes cardiovascular disease. Accordingly, in an appreciable proportion of deaths of diabetics from cardiovascular diseases, the diabetes is reported as an associated condition while in the remainder it appears as the underlying cause of the cardiovascular disorder.[10]

Most of the foregoing factors are not measurable and contribute to uncertainty in understanding the true trend of any particular disease. Thus, these factors must be taken into account qualitatively in the interpretation of mortality data.

Changes in medical concepts have important implications bearing on the form used for the medical certification and on the system of disease classification. Both of these devices to compile needed statistics should be examined from time to time in order to assure

that they are abreast of medical progress. This is the purpose of decennial revisions of the International Lists of Diseases and Causes of Death. Inasmuch as the Seventh Revision of the International Lists was a limited one, it is recommended that study and preparation be made early for a thorough examination of the International Lists and the medical certificate form for the Eighth Revision proposed for 1965.

5. The Facts Available to the Certifying Physician

The statement of cause of death in the medical section of the certificate is a summary of the diseases and morbid conditions involved in the death. For a complete and adequate statement, the certifying physician should review available clinical and laboratory findings, and develop from the complete diagnostic information his concept of the event or train of events which led to death. He is also asked to report, if any, "other significant conditions contributing to the death but not related to the disease or condition causing it."

If the complete facts concerning the illness of a patient were available to the physician, the accuracy of diagnosis would be limited only by the status of medical knowledge and acumen of the physician. The extent of the known facts may vary from the limited information available to the physician first called in attendance in the final illness to a well worked up record in a teaching hospital or clinic. In this respect, the information is most deficient when a case of sudden death without medical attendance is referred to the coroner or medical examiner.

In its present form, the medical certificate of death is designed to elicit from the medical certifier the train of morbid conditions that terminated in death. For many cases, particularly the chronic diseases, the relationships among the associated diseases may not only be complex, but may also be obscure. In this situation, the physician is faced with the difficult task of singling out one train of events leading to death. How frequently the physician undertakes to do more than is warranted by the facts available to him is not known. This is an area where study is required in order to obtain measures of reliability of reporting causes of death. Follow-back studies have been made in Chicago [11] and in Pennsylvania [12] to ascertain the effect on medical certification of the length of time the certifying physician had the patient under observation, the sources of diagnostic information, the basis for diagnosis (physical examination, laboratory tests, x-ray, EKG, biopsy, post-mortem examination, etc.), and the extent of the efforts to secure information in cases of "sudden death."

It is recommended that this type of study be extended nationally. In addition, local areas interested in assessing reliability of cause-of-death statistics might undertake similar studies in collaboration with clinicians.

6. Understanding of Medical Certification Procedures by the Certifier

Even if all the diagnostic information were available, the medical certifier must communicate this information completely and without ambiguity. This means that the certifier must have a clear understanding of what is required in a statement of causes of death, as well as a sense of responsibility in completing the medical certificate form.

There is little information on the extent of understanding of medical certification procedures. In most instances, there does not appear to be any great difficulty in making medical returns. However, on a large number of death certificates the medical certification is obviously inconsistent or the form inadequately filled out. It has been estimated that in from 20 to 25 per cent of death certificates, the medical certifica-

tion is not clear as to the certifier's opinion of the underlying cause of death.

In 1956 a study was conducted among 200 physicians with practices in Philadelphia, Cleveland, rural Ohio, and rural Virginia by the National Office of Vital Statistics, using Bureau of the Census interviewers. The purpose of this study was to identify the problems faced by physicians in certifying causes of death, and to ascertain the degree of understanding of medical certification methods on the part of the physician interviewed. The returns, not yet fully analyzed, indicate that the groups interviewed were very willing to receive guides on medical certification procedures.

About a half of all deaths occur in hospitals and allied institutions. In many hospitals, the causes of death are reported by the resident, pathologist, or superintendent, and not by the physician assigned to the case. Accordingly, the medical record is relied upon almost completely for information as to the diseases and conditions involved in the death. There is a great deal of variation from one institution to another in the handling of death records, including assignment of responsibility for certifying the causes of death, and the manner in which they are certified.

Because of the large proportion of deaths occurring in institutions, it would be desirable to study, on a sample basis, hospital procedures with respect to the death certificate. Any common patterns in procedures according to some characteristic of the hospital facility would provide bases for developing uniform practices of medical certification in hospitals.

More information is needed concerning the problems of medical certifiers in filling out the statement of causes of death. Identification of barriers would provide a basis for preparing educational material to assist the medical certifier.

It is recommended that a thorough study be made of the medical certifiers' attitudes and problems to determine the most effective procedure in promoting better understanding of methods of medical certification, particularly among medical students and hospital staff members. More effective teaching methods should be developed for this purpose.

7. The Selection of the Primary Cause of Death

Causes of death are classified to the categories of the International Lists of Diseases and Causes of Death according to the international rules for selecting the cause for primary tabulations. Where the statement of causes of death is properly reported, the coding of causes of death is a relatively simple matter for a qualified cause of death coder. However, when the sequence of events and the underlying cause are not clear, special coding procedures are provided by international rules. Additional interpretative notes and procedures for use in the United States are contained in the Vital Statistics Instruction Manual which is issued annually by the National Office of Vital Statistics.

These special coding rules present problems because of their necessarily arbitrary nature. As indicated by the studies conducted by the Public Health Conference on Records and Statistics, the majority of the physicians interpret certain medical terms or sequence of events in the same way in many cases, but it is rare to find unanimity of opinion. If it becomes necessary to develop special coding rules, they should first be validated by query of certifiers, as is now being done. However, it is clear that arbitrary coding rules are not substitutes for the medical certifier's judgment. An intensive effort should be made to improve the quality of the medical returns in order to decrease the

necessity of resorting to arbitrary coding rules. One means is through querying of improperly returned statements of causes of death. It is recommended that all vital statistics offices conduct intensive query campaigns where statements of causes of death are not properly returned with the view to promoting better understanding of medical certification procedures.

8. The Quality of the Cause of Death Coder

The statement on the medical certification must be interpreted and translated to a code number of the International List by a coder. The efforts to improve the quality of the statement are lost if the coder is not fully qualified for the work. This work requires an intensive training and experience which should be recognized in setting standards for the job.

Discussion

Neither the death certificate nor mortality statistics were ever intended to provide a comprehensive picture of morbidity. The nature of the data and the various inadequacies discussed places certain realistic limits on the usefulness of mortality statistics; these vary both geographically and in the course of time. However, mortality data, even at this stage of development, have proved useful in epidemiologic studies. Perhaps the most extensive recent use of mortality statistics for epidemiologic studies has been in the cancer field. Hammond and Horn [13] and Doll and Hill [14] have contributed a series of studies on the association between lung cancer and smoking habits. Haenszel, Marcus, and Zimmerer [15] have found that the pattern of cancer mortality follows a pattern similar to cancer morbidity. In studies of other diseases, cause of death data have been used less intensively.

The full potentials of mortality data for epidemiologic studies have not been exploited. Improvement in the quality of cause-of-death information should greatly enhance its usefulness to provide leads to clinical, laboratory, and epidemiologic investigations.

Summary of Recommendations

The foregoing considerations lead the committee to recommend:

1. That, in view of the difficulty in singling out a train of events leading from an underlying to a terminal cause of death with the present systems of medical certification and classification of diseases, consideration be given to the fuller development of a disease-complex type of classification preparatory to recommendations for the Eighth Revision of the International List in 1965.

2. That the present unsolved problems in the preparation of multiple cause tabulations be studied, with consideration also given to the possibility of special studies in this connection by collecting data in addition to that now reported on the death certificate. In particular, follow-back studies should be made to ascertain the kind of information that may not appear on the medical certification but which would be helpful for more adequate classification of the morbid conditions.

3. That, in view of the important implications that changing medical concepts have for the form used for medical certification and on the system of disease classification, study and preparation be made early for a thorough examination of the International List and the medical certificate form for the Eighth Revision proposed for 1965.

4. That, in view of the effect of the facts known to the certifier on the quality of the medical certification, study be made both nationally on a sample basis and locally, of such factors as the sources of the information on the diag-

nosis, the bases for the diagnoses, the length of time the certifying physician had been in attendance on the deceased, and the extent of efforts to secure information in cases of "sudden death."

5. That a study be made of the medical certifiers' attitudes and problems to determine the most effective procedure in promoting better understanding of methods of medical certification, particularly among medical students and hospital staff members. More effective teaching methods should be developed for this purpose.

6. That all vital statistics offices conduct intensive query campaigns where statements of causes of death are not properly returned with the view to promoting better understanding of medical certification procedures.

7. That, where possible, the studies suggested in the foregoing recommendations include investigations into geographic and temporal variations.

8. That, in view of the importance of the cause of death coder in interpreting and translating the statement on the medical certificate to a code number of the International List, the intensive training and experience required of the cause of death coder be recognized in setting standards for the job.

9. That the full potentials of cause of death data be exploited to provide leads to clinical, laboratory, and epidemiologic investigations.

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Journals Wanted

The Association has received several requests for the May, June, July, and December, 1957, Journals from persons who bind the magazines. These persons and the Association would be grateful if members having no use for these particular issues would make them available to others. Such generosity will be much appreciated. The magazines should be sent to the Association office at 1790 Broadway.

George Rosen, M.D., Editor; Berwyn F. Mattison, M.D., Managing Editor. EDITORIAL BOARD—Granville W. Larimore, M.D., Chairman; Martha L. Clifford, M.D.; Howard W. Ennes, Jr., M.P.H.; John J. Hanlon, M.D.; Edmund K. Kline, Dr.P.H.; Perry F. Prather, M.D.; the Editor and Managing Editor. STAFF—Lydia Gabl, Editorial Assistant; Elizabeth Kellogg, Editorial Assistant; Frances Todrock, Editorial Associate; Willimina Rayne Walsh, Associate Secretary.

Journal of Public Health

EDITORIALS

WHO for Water Fluoridation

SUPPORT IN favor of water fluoridation continues to accumulate. A forthright statement on this issue comes from the Expert Committee on Water Fluoridation of the World Health Organization. In the opinion of this group, "The effectiveness, safety and practicability of fluoridation as a means of preventing dental caries (decay), one of the most prevalent and widespread diseases in the world, is now established."

Expressed in a report drawn up at the recent meeting of the committee in Geneva, this view is based on a study of hundreds of controlled fluoridation programs in 17 countries, some of them in operation for over 12 years. In the United States, alone, mechanically fluoridated drinking water is used by 32 million people in more than 1,500 communities. Programs are also being carried on in one or more communities in Australia, Belgium, Brazil, Canada, Chile, Colombia, El Salvador, the German Federal Republic, Japan, Malaya, the Netherlands, New Zealand, the Panama Canal Zone, Sweden, the United Kingdom, and Venezuela. Norway and Switzerland are about to initiate similar undertakings.

According to the committee, the results of these programs exhibit remarkable uniformity. A decrease of some 60 per cent was found in the prevalence of dental caries in the permanent teeth of children, the reduction in the first (or milk) teeth ranged from 50 to 60 per cent. Related to these results are the findings in studies of adult populations in areas where fluorides occur naturally in drinking water. Caries prevalence was found to be only about one-third as much as in similar groups in areas free of fluoride. The results of these studies show clearly that identical dental and general effects are produced by drinking water containing one part of fluoride per million parts of water, no matter whether the fluoride is present naturally or is added by mechanical means.

The safety and practicality of water fluoridation are strongly emphasized. On the question of safety the most convincing evidence comes from areas where people have always used naturally fluoridated water. Except for mottled teeth, in places where the natural concentration of fluoride is too high, no ill-effects have been detected. On the basis of observations and experiments by scientists in many countries of the world, the WHO committee concluded: "All these findings fit together in a consonant whole that constitutes a great guarantee of safety; a body of evidence without precedence in public

health procedures." As to the engineering aspects, the addition of fluoride to public water supplies is similar to chlorination and other routine mechanical procedures widely employed in waterworks practice. It has been found practical in various kinds of plants with differing degrees of complexity of treatment. Furthermore, no other technic for the prophylactic application of fluorides can at present adequately substitute for fluoridation of drinking water. Direct application of fluorides to the teeth has been found to reduce caries and may provide a substitute, but it requires high cost in professional working time and is therefore limited in its application as a large-scale public health measure. Research on alternative methods of fluoride administration is necessary, especially areas where water fluoridation cannot be practiced.

In this connection the WHO committee also pointed out that efforts to prevent dental caries have taken many forms ranging from oral hygiene to stringent dietary control. Some of these are effective on an individual basis, but their application on a population-wide basis has been generally disappointing. It is this circumstance which gives the fluorides and water fluoridation a special interest for the problem of prevention.

At its 84th Annual Meeting in Atlantic City (November, 1956), the American Public Health Association reaffirmed its declared support for the fluoridation of public water supplies. On December 5, 1957, the American Medical Association expressed the opinion that water fluoridation is "a safe and practical method of reducing the incidence of dental caries during childhood." It is gratifying now to have on record not only the important professional societies in the public health field and the national scientific agencies, but also the agency which officially represents international public health.

Sir Robert W. Philip (1857–1939) —Pioneer of Tuberculosis Control

THE RECENT publication of a volume of memories and impressions of Robert Philip * appropriately recalls the achievement of a pioneer in community organization against tuberculosis. Born in Edinburgh in 1857, Philip was the architect and builder of the edifice of tuberculosis control in Great Britain.

On March 24, 1882, Koch announced to the world his discovery of the tubercle bacillus as the etiologic agent of tuberculosis. The concept of tuberculosis as a disease entity, originally set up on purely clinical and pathological-anatomical grounds, was now confirmed by bacteriological discovery. Ten years elapsed, however, between Koch's announcement and the beginning of the first organized campaign against the disease in the United States. Meanwhile, the implications for community action had been recognized by Robert Philip who saw that "if the community as such was to benefit practically by the discovery, there appeared to be need of centralized effort in order to ascertain the extent of tuberculosis in a district, and to devise means for its limitation and prevention." The result was the opening in 1887 of the Victoria Dispensary for Consumption, the first tuberculosis dispensary in the world. Philip's program also included home visiting, health education, and an occupational farm colony for patients. This pioneer endeavor was followed in 1898 by the organization of the National Association for the Prevention of Consumption and Other Forms of Tuberculosis for the purpose of preventing the ravages of the disease in Great Britain. Its objectives were to educate the public concerning the propagation and prevention of tuberculosis, to influence Parliament and other public bodies in matters

relating to the prevention of the disease, and to establish branches of the Association to stimulate action on a local level.

All over the world the ideas and accomplishments of Robert Philip were followed with keen interest. Lawrence F. Flick, the Philadelphia physician, who in 1892 organized the first tuberculosis society in the United States, knew of his work and corresponded with him concerning his methods. Philip visited the United States in 1908 to attend the Sixth International Congress on Tuberculosis in Washington, D. C., and during his visit he lectured at Boston on the coordination of preventive measures in antituberculosis work.

In 1911, following the passage of the National Health Insurance Act, a departmental committee was appointed to study the preventive and curative measures against tuberculosis and to recommend a suitable course of action to the British government and the local insurance committees. Philip was a member of this committee and provided invaluable experience and advice. In 1917 he was appointed professor of tuberculosis in the University of Edinburgh, the first chair of its kind, and from 1918 to 1923, he was president of the Royal College of Physicians. He was knighted in 1913.

Today, in countries like Britain and the United States, the biological balance appears to have turned against the tubercle bacillus to a greater extent than ever before. At this time, therefore, it is particularly fitting to recall the dreams and goals of those who like Robert Philip created the present, and to be reminded of the noble legacy which is ours. The inexorably oncoming challenges of the future will be shaped and directed by what has gone before. We will be better able to face tomorrow because we have seen yesterday and learned about those who gave form and impetus to the present. Among the movers and shakers was undoubtedly Robert Philip, a remarkable and inspiring man, whose acquaintance can best be made through a reading of the delightful volume of recollections issued to honor the centenary of his birth.

* Sir Robert W. Philip, 1857–1939. Memories of His Friends and Pupils. National Association for the Prevention of Tuberculosis, London and Edinburgh, 1957.

Measuring Ability to Pay for Health and Social Services

MANY VOLUNTARY and public agencies that provide social and health services charge fees of some of their clients. Actually, payments by clients now comprise an important source of income for voluntary agencies in various areas of service. A recent study of social welfare expenditures and their financing in New York * reveals that in 1954 fees from clients provided 16, 20, and 34 per cent of the income of visiting nurse services, voluntary day care agencies, and independent mental health clinics, respectively. Furthermore, there are numerous indications that this trend will in all likelihood continue and that fees will in the future constitute an increasingly important source of income for the voluntary agency. Several years ago the sociologist William F. Ogburn called attention to the implications of the rising standard of living in the United States.† The effect of this rise, he pointed out, has been to reduce poverty, to modify greatly the types of family expenditure, and in general to raise the expenditures of the working class so as more nearly to approximate those of the middle class. At the same time the clientele of health and welfare agencies, public and private, has tended to expand as their agency functions and responsibilities have widened from an almost exclusive

concern with indigent and marginal income families to the provision of service for all income groups of the community. In the light of these trends there has developed a general recognition of the need for a reasonable fee policy. What this requires, however, is a tool capable of determining ability to pay for services rendered by public and voluntary agencies.

Earlier attempts at evaluating financial capacity were undertaken to determine the amount of income needed to maintain a family at a subsistence level of consumption. These evaluations, employed for research and in implementing social policy, were essentially poverty standards. From the pioneering work of Charles Booth and Seebohm Rowntree at the end of the last century to the present, such standards based on certain stated minimum necessities—food, clothing, fuel, light, rent, transportation, et al.—have been used to determine the extent of poverty and the eligibility of individuals or families for public assistance. (In considering these poverty standards one cannot help but be struck by their arbitrary character and implicit moralistic bias. It seems almost as if the indigent were expected to be skilled dietitians with a marked leaning to puritanism.) Essentially, such minimum standards are theoretical models of how the indigent ought to spend their money to obtain certain basic necessities specified by those preparing the standard. In their very nature they cannot, therefore, provide a yardstick for measuring ability to pay for service at economic levels above the minimum subsistence line. An instrument to do this can be devised only in the light of knowledge about family budgets. But how can such a yardstick be developed with the least arbitrariness and maximum flexibility and still be simple and practical enough in its day-to-day application?

An interesting and significant answer to this question has been provided recently by the Community Council of Greater New York in its report, "How to Measure Ability to Pay for Social and Health Service." ‡ The Council realized some time ago that the health and welfare agencies in New York City needed and wanted instruments to assist in the development of a rational basis for fee charging, an area characterized by a wide diversity of policy and practice. In 1955 it published "A Family Budget Standard for the Use of Social and Health Agencies in New York City" as a tool for determining the income needed to maintain a modest but adequate level of living for families of various size and age composition. The "Family Budget Standard" is an adaptation of the "City Worker's Family Budget" developed by the U. S. Bureau of Labor Statistics as part of an effort to clarify the concept of minimum income requirements for self-supporting status, as distinguished from the minimum for determining public assistance grants.

The report on measuring ability to pay now provides a simple and practical formula for determining differential costs of the Family Budget Standard for various types of families and for making adequate allowance for such differentials in establishing fees. The measure of ability to pay is defined as "the margin, or excess, of funds available to the family after allowance has been made for taxes and other requirements of family living." The size of the margin is the basis of the fee scale structure. The report points out that in undertaking to determine how much of the margin may be regarded available for fee payment, consideration should be given to the type of service rendered, the anticipated period of treatment, and the extent to which the agency is prepared to offer services at subsidized cost.

"How to Measure Ability to Pay for Social and Health Services" is significant as the first publication of its kind representing agreement reached by voluntary and public agencies on the factors to be considered in determining ability to pay fees for health and social services. It is applicable to a wide variety of agencies, including hospital clinics and similar facilities. At the same time it is an interesting and valuable contribution to a systematic analysis of consumer economics in the area of health and social service.

* Social Welfare Expenditures and Their Financing. New York: Research Department, Community Council of Greater New York, 1957.

† Ogburn, William F. Implications of the Rising Standard of Living in the United States. Am. J. Sociol. LX:541–546, 1955.

‡ How to Measure Ability to Pay for Social and Health Services. Budget Standard Service, Research Department, Community Council of Greater New York, 1957.

NSF "Approval Applied For" Seal

The National Sanitation Foundation has authorized the use of its Seal of Approval to manufacturers who build equipment that has been accepted by the National Sanitation Foundation Testing Laboratory as meeting the public health standards established by the Laboratory. An annual listing is published showing the manufacturers and the products approved.

Permission to use a new "Approval Applied For" seal is now being given to a manufacturer of special devices or products having sanitation significance, if he has applied for approval, if preliminary investigations indicate no apparent public health hazard in the equipment, and if the equipment complies fully with the standards established by the Laboratory. The new seal will bear the legend "Approval Applied For, National Sanitation Foundation Testing Laboratory. Accepted for Testing After Preliminary Evaluation."

CREDIT LINES

The Journal cannot furnish copies of items mentioned in Credit Lines. Please send requests to the addresses given.

The Church and Social Welfare

"Policy and Strategy in Social Welfare" is "a consensus of opinion" reached by a National Conference on Policy and Strategy in Social Welfare held in Atlantic City, May 7–10, 1957, by the National Council of Churches of Christ in the United States. Attended by 265 voting delegates of 22 Protestant and Eastern Orthodox denominations and 22 nonvoting representatives of 11 denominations and other organizations not belonging to the National Council, four days of discussion, with the chairmanship of Leonard W. Mayo, "threshed out the chief concerns and problems of the Churches in relation to welfare needs and services." These views are now addressed to the denominations and their members in the hope that they "will contribute to a clearer understanding of how the Churches may cooperate to strengthen their ministry of Christian service" of today.

The statement of motivation has been called "the Magna Carta for the Churches' activity in social welfare." It declares that "the social welfare activity of the Church is inherent in its primary mission" but must "not be evaluated in terms of its success in making Christians of those whose need is served."

Here are stated the objectives of the Churches' social welfare task, the areas of social need outlined—14 of them from strengthening family life, adequate housing, better schools, assistance to migrant laborers, rehabilitation of disabled, aged, and special groups, such as drug addicts and prisoners, improved working conditions, recreation, conservation of natural resources, to relief and rehabilitation of needy persons in other lands.

Here also are thought-provoking statements of the relation of church and state with particular reference to accepting tax funds, of the churches' relationship to other community agencies, and of the responsibility of church-related agencies.

This 50-page "report to the churches" is far from irrelevant to public health workers. It outlines what may be expected from the Protestant world as it develops its position widely in relation to social welfare activities and what is the responsibility of the individual Protestant health and welfare worker.

William J. Villaume, Ph.D., is the executive director of the Council's Department of Social Welfare which organized the conference. The report is available from the department, National Council of Churches, 297 Fourth Ave., New York 10: 75 cents.

A Good Piece of Public Relations

The University of North Carolina School of Public Health is housed in 10 different buildings, including Quonset huts and temporary World War II buildings. This is one of the facts mentioned in a recent news release from the school.

But this is not the fact stressed. Most of the three-page release is devoted to what the school does for North Carolina. In short, terse sentences it says that the school trained all of the trained health educators in the state, 95 per cent of the public health nurses, 90 per cent of the sanitarians, and three-fourths of the health officers.

Of the 1,500 public health workers

in the state, 1,000 are in the 67 local health departments that serve all of the 100 counties.

In addition to the 150 regular students trained annually, instruction is given to more than 500 students in other departments of the university, as well as some 1,200 from outside the university trained in summer courses, extension, or field courses.

All this and more has developed in 21 years. First, there was a faculty of four and a state appropriation of $4,500, now 80 per cent of the budget comes from other than state tax sources.

After all these exiting facts the Quonset huts, old waterworks building, and 10 different buildings are just barely mentioned. Nowhere is there underlining of "the school needs a building," but one can believe the thoughtful citizen will say it.

Child Amputee Program Amplified

The Michigan Crippled Children's Commission has recently published a 70-page brochure describing in some detail its program for childhood amputees with special emphasis on the upper extremities. The special project on childhood amputees that had been under way since 1946 was selected by the Children's Bureau for support as a demonstration project whose services would be available to other children in an area, including several states in addition to Michigan. This area amputee program, in operation since 1955, has received both national and international recognition.

The brochure is a profusely illustrated and carefully prepared report of the chief problems of 226 upper extremity child amputees. It includes specific information on the types of prosthetic devices used, frequency of changes and repairs of these devices, and the auxiliary training services required, with average costs for each aspect of the program computed. Details of the various types of prosthetic appliances used on children from as young as five months to two years of age are clearly illustrated in a series of "exploded" diagrams and photographs.

The brochure was prepared by Carleton Dean, M.D., director, Michigan Crippled Children's Commission, for presentation at the Seventh World Congress of the International Society for the Welfare of Cripples held in London, July, 1957. A limited number of the brochures or excerpts from it are available from him at Lansing, Mich.

A Canadian "First"

"National Voluntary Health Associations in Canada" represents the first publication in one place of the reports of 16 national voluntary health associations of that country. It is labeled "a summary of their objectives, existing organization and financing" and includes each voluntary association having as its objective the attack on some particular disease or group of diseases. Professional associations are not included.

Perhaps its nearest counterpart in the United States is the directory of member agencies of the National Health Council. However, the Canadian volume gives more detailed information including a brief review of the status of the control program of the particular disease for which the agency takes responsibility.

Another difference is that the Health League of Canada which publishes the report, deals with many conditions that in the United States have separate organizations. For example, it has social hygiene, immunization, fluoridation, gerontology, and alcoholism divisions.

Included in the 90-page volume are three addresses delivered at the 1956 and 36th annual meeting of the Health League. Gordon Bates, M.D., is gen-

eral director of the League which also serves as Canada's Citizens' Committee for WHO. Dr. Bates might be glad to share a copy of his "first" with others. 111 Avenue Road, Toronto.

Professional Education Film Strip

The National Foundation for Infantile Paralysis is distributing a 15-minute film strip on "Professional Education: The Key to Research and Patient Care." Described as "a 69-frame, 35 mm, color film strip emphasizing the personnel problems involved in meeting the health demands of the nation," the film indicates ways in which voluntary and official health agencies are cooperating in meeting health demands. The film is designed especially for professional groups, hospital and university boards of trustees, college and university student and vocational counselors, and community groups. Available either on free loan or purchase at $12. Division of Professional Education, National Foundation for Infantile Paralysis, 301 East 42nd St., New York 17.

1957 Tuberculosis Program Aids

Among the 1957 publications of the National Tuberculosis Association are a number that would be equally useful for health workers other than those in the tuberculosis field. They should be particularly valuable in making the necessary cooperation among local health agencies an informed working together.

"A Guide for the Development of Rehabilitation Programs in Tuberculosis Associations" and "A Handbook on Social Services for the Tuberculosis Patient" are equally valuable for other agencies that might be carrying on or cooperating in such programs. "Facts about Tb" is a guide for speakers and writers in and out of tuberculosis associations. The "1957 Catalog of Tb and Health Materials" lists a wealth of audiovisual material for use in the tuberculosis programs of health departments. "Success Stories" (of routine admission chest x-ray screening programs in general hospitals and reprinted from the NTA Bulletin) is excellent experience material relating to such a program. From local tuberculosis associations or the National Office, 1790 Broadway, New York 19.

Mental Health Book Review Index

Now in its third year, the Mental Health Book Review Index is appearing under new auspices. This semiannual supplement to the "Psychological News Letter" of New York University is currently sponsored jointly by the World Federation for Mental Health, the International Council of Women Psychologists, and the Research Center for Mental Health of New York University and is to be self-supporting. Its original sponsor was the now defunct Adult Education Board of the American Library Association.

As outlined in an earlier Journal, the index includes those volumes in the broad field of mental health that have been reviewed in at least three of the technical journals of the field. Co-chairman of the committee are Ilse Bry, former library associate, Neuropsychiatric Library, New York University—Bellevue Medical Center Library and Margaret M. Kinney, chief librarian, VA Hospital, Bronx, N. Y. The index is included in the annual subscription of $2 to the Psychological News Letter. For others it is $1 per year. Lois Afflerbach, Paul Klapper Library, Queens College, Flushing 67, N. Y.

Worth Acquiring

"The Years Between: The Role of Today of Women in Middle Age" is the

highlight of a conference sponsored in 1956 by the Jewish Vacation Association in celebration of its 30th anniversary. It was reportedly "one of the first occasions in which a single, unified group met to focus attention" upon the problem of woman's middle years—considering the woman as a whole—mentally, spiritually, physically. The middle years were not defined exactly, but roughly the period after children are grown up and away—somewhere in the 40's or 50's. "Any woman who is 10 years older than you are at the present moment."

Jewish Vacation Association, 207 East 84th St., New York 28. No information as to cost.

"Methods for the Detection and Identification of Chemical Warfare Agents in Aqueous Carriers," one in the series, Public Health Problems in Civil Defense, prepared by the Public Health Service, outlines relatively simple methods for detection and identification of chemical contaminants in water. Here are outlined ways of detecting and identifying various chemical warfare agents that might be used by a possible enemy. Such easy identification is among the principal stumbling blocks in setting up a protective program against chemical contamination of water.

Adaptation of the methods to field conditions is possible. Six rapid colorimetric tests are presented for the detection and identification of sarin, tabun, and soman (G-agents); sulfur and nitrogen mustards; arsenicals, cyanides, and fluoro-organic compounds. Lawrence J. Kamphake and Paul W. Kabler, M.D., are authors of the report. Public Health Service publication No. 529, Public Health Service, Washington 25, D. C.

Louis Livingston Seaman Research Fund

The New York Academy of Medicine is receiving applications for grants-in-aid for the furtherance in research in bacteriology and sanitary science. From the Louis Livingston Seaman Fund, set up by the will of the late Louis Livingston Seaman, M.D., $1,900 is available for assignment in 1958. Use of the fund is limited to grants-in-aid for investigation or scholarship for research in bacteriology or sanitary science and the expeditures may be used for securing technical help, aid in publishing original work, and purchase of necessary books or apparatus.

The final date for receiving applications from institutions or individuals is March 1, 1958. The Fund is administered by a committee of the Academy, whose chairman is Wilson G. Smillie, M.D., to whom applications should be sent. 2 East 103rd St., New York 29, N. Y.

ASSOCIATION NEWS

DR. MATTISON NEW EXECUTIVE SECRETARY

BERWYN F. MATTISON, M.D., M.P.H.

The Executive Board of the American Public Health Association has announced the appointment of Berwyn F. Mattison, M.D., M.P.H., secretary of health of Pennsylvania, as executive secretary of the Association succeeding the late Reginald M. Atwater, M.D., effective January 1, 1958.

Dr. Mattison is a native of Glens Falls, N. Y. He took his premedical training at the Rensselaer Polytechnic Institute where he received a B.S. degree in biology. Following this he had a teaching fellowship in the University of California at Berkeley where he was awarded the master of arts degree. His medical education was taken at McGill University in Montreal and his internship in Grasslands Hospital, Westchester County, N. Y., with further special hospital training in tuberculosis in Raybrook Sanitarium, N. Y., Ste. Agathe in Quebec, and in Mt. Morris Hospital, and special work in chronic disease at St. Barnabas Hospital in New York. He has a master of public Health degree from the Johns Hopkins University School of Hygiene and Public Health.

His experience has been at all levels of health department administration. Beginning in 1941 he was on the staff of the New York State Health Department as assistant and later as district state health officer. A two-year period as commissioner of health of Yonkers followed. In 1948 he became commissioner of the Erie County (New York) Department of Health where he fathered the consolidation of the County Department of Health with that of Buffalo and the other municipalities in the county. The Erie County Health Department was the second largest county health department in the United States when Dr. Mattison headed it. He has been secretary of health of Pennsylvania since early 1955. Pennsylvania, as the third largest state, has the third largest state health department with 4,000 employees.

Dr. Mattison is a diplomate of the American Board of Preventive Medicine and a Fellow of the American College of Preventive Medicine, a Fellow of the American Public Health Association and a member of its Governing Council, a member of the American Medical Association and his state and county medical societies. Dr. Mattison has served as chairman, member, or adviser to many groups. For example, he was chairman of the Pennsylvania Sanitary Water Board, a member of the Ohio River Valley Water Sanitation Commission, and a member of the Interstate Commission on both the Po-

tomac and the Delaware River Basins. He is adviser to the Public Health Service in the area of heart disease and training needs in public health and a member of the Surgeon General's Advisory Committee on Radiological Health. He is a delegate to the National Health Council.

When in Erie County Dr. Mattison was president of two voluntary health agencies—the Western New York Committee for Education on Alcoholism and the Erie County Chapter of the American Cancer Society.

Dr. Mattison is married to the former Ann McIntyre Bell. They have two children, Craig, 16 years and Diane, 13 years of age.

RESOLUTIONS

The following Resolutions were unanimously adopted by the Governing Council, American Public Health Association, at its Eighty-Fifth Annual Meeting in Cleveland, Ohio, November 13, 1957.

Reciprocity for Inspection Programs

WHEREAS, municipal, county, and state health departments have in a number of instances adopted conflicting standards for milk sanitation and likewise for food sanitation and

WHEREAS, these agencies carry out inspection programs at the sources of supply which result in confusing and expensive duplication of effort, therefore be it

RESOLVED, that the American Public Health Association urge the adoption of uniform standards for milk and food sanitation and the development of a system of reciprocal certification.

Public Health Service Assistance on Housing

WHEREAS, local health departments in most communities are participating in programs of the hygiene of housing, urban renewal, and urban redevelopment and

WHEREAS, these programs require the development of newer skills and technics to provide safe, sanitary, and adequate housing, therefore be it

RESOLVED, that the Public Health Service be requested to increase its activities in the hygiene of housing and to expand its consultative services to state health departments and other state and federal agencies and to implement research and related programs in the field of housing.

Radiologic Health Programs

WHEREAS, there is growing public concern regarding the health hazards of ionizing radiation, and

WHEREAS, exposure of the population to ionizing radiation is increasing from a variety of sources, and

WHEREAS, the need for sound control programs is increasing, and

WHEREAS, the respective states and their political subdivisions are responsible for the protection of the public health, therefore be it

RESOLVED, that the American Public Health Association recommend that official public health agencies take the necessary steps to have members of their staffs prepared for new responsibilities as a result of the increasing hazards of ionizing radiation, and toward this end be it further

RESOLVED, that health agencies be urged to select personnel for specialized training and that educational institutions establish the necessary courses of instruction so that the full development of radiologic health programs will be assured.

Employment of Qualified Personnel in Public Health

WHEREAS, health personnel who do not meet recommended professional qualifications recently have been appointed to leadership positions in public health agencies, and

WHEREAS, these actions have resulted in the resignation of qualified staff personnel, and

WHEREAS, the American Public Health Association has for many years worked for the improvement of the professional qualifications of public health personnel through its Committee on Professional Education, therefore be it

RESOLVED, that employers and agencies, including civil service commissions, responsible for the selection of public health per-

sonnel be advised of the importance of filling positions with individuals who meet the recommended qualifications for their professional group as stated by the Committee on Professional Education of the American Public Health Association.

Occupational Health Programs for Governmental Employees

WHEREAS, federal, state, and local governmental agencies are large-scale employers, and

WHEREAS, approximately half of the federal employees, and the vast majority of state and local government employees are not presently covered by occupational health programs, and

WHEREAS, the advantages of such programs have been demonstrated adequately by industry and certain governmental agencies, and

WHEREAS, government should meet desirable patterns for health programs, therefore be it

RESOLVED, that the American Public Health Association recommend the early establishment and maintenance of occupational health programs by all governmental agencies for their employees.

Accident Prevention

WHEREAS, accidents are now the leading cause of death in all age groups from one to 35, and

WHEREAS, accidents kill more children than all diseases combined, and

WHEREAS, accidents are the greatest single cause of loss of productive years of life, and

WHEREAS, accidents cost the nation more than 10 billion dollars a year, and

WHEREAS, public health departments can, by the application of present knowledge, make a significant contribution to a decrease in the present annual toll of accidental deaths and injuries, therefore be it

RESOLVED, that state and local health departments give high priority to the orientation and training of staff members in accident prevention principles and technics and inaugurate state and local accident prevention programs as rapidly as available funds and personnel will permit.

Recommended Public Water and Sewerage Systems

WHEREAS, there is a continuing movement of the population from urban areas to suburban areas, and

WHEREAS, the installation of individual wells and septic tanks in subdivisions and fringe areas must be looked upon as only a temporary solution for providing water supply and waste water disposal, therefore be it

RESOLVED, that the American Public Health Association call upon the Housing and Home Finance Agency and other federal, state, county, and municipal agencies to require, where feasible, the installation of adequate public water and public sewerage systems.

Continuation of the Services of the Veterinary Corps of the Army and Air Force

WHEREAS, the Veterinary Corps of the Department of the Army and that of the Department of the Air Force provide integrated inspectional services for food items of animal origin for the entire Department of Defense, and

WHEREAS, the maintenance of the standards for these services cannot be delegated without great risk of their deterioration, and

WHEREAS, the global responsibilities of the Department of Defense make the professional skills of these Veterinary Corps a bulwark for the protection of the members of the Armed Services and their dependents against animal diseases transmissible to man, uniquely complementing the skills of the other professional corps of the Armed Services, therefore, be it

RESOLVED, that the American Public Health Association deems as essential the continuation of the services of the Veterinary Corps of the Army and Air Force under their respective Surgeons General, and be it further

RESOLVED, that the Department of Defense be requested to rescind the order of October 7, 1957, transferring these functions to the Department of Agriculture.

Support of Water Pollution Program

WHEREAS, an effective national water pollution control program is essential for the protection of the nation's health and full development of its water resources, and

WHEREAS, such a program is dependent on strengthened state and local water pollution control programs, the construction of needed treatment works, control of interstate pollution, improved technical assistance, research and basic data on water pollution problems, and

WHEREAS, the Federal Water Pollution Control Act (Public Law 660-84th Congress) has

contributed materially to the strengthening of state water pollution control programs through the provision of technical assistance and program grants to states and municipalities, and

WHEREAS, the benefits of this broad program are just beginning to be realized, therefore be it.

RESOLVED, that the American Public Health Association encourage the federal government to fully implement all provisions of the Federal Water Pollution Control Act, including the authorization of sufficient funds over an extended period for grants for the construction of municipal waste treatment works.

Code Governing Labeling of Hazardous Chemicals

WHEREAS, there are many household and other chemicals which are hazardous under certain conditions of use as evidenced by the reports of the poison control centers throughout the country, and

WHEREAS, for the protection of the user such chemicals should be labeled so as to have cautions and warnings to prevent misuse and hazard to the user with possible danger to health and loss of life, and

WHEREAS, several bills proposed to provide such legislation have failed of enactment in Congress and in order to avoid conflicting local variances in regulation a model uniform law is most desirable, and

WHEREAS, the Committee on Toxicology of the American Medical Association has undertaken to develop a model uniform law for the control of hazardous chemicals which law might be used by local, state, or federal agencies, therefore be it

RESOLVED, that the American Public Health Association support the adoption of a uniform law for the control of hazardous chemicals by the states and territories.

Federal Legislation on Food Additives

WHEREAS, the American Public Health Association in 1949 recommended to the Congress that it amend the existing Food, Drug, and Cosmetic Act to prevent the incorporation into foods of chemicals or other new ingredients before they have been reviewed and approved by the Food and Drug Administration, and

WHEREAS, the Congress has enacted legislation directed to the control of residues of pesticide chemicals in food, and

WHEREAS, possible legislation to require pretesting and approval, prior to their introduction in foods, of additives other than pesticide chemicals, is being considered or will be considered, by the Congress, and

WHEREAS, it is in the interests of health of all consumers of foods that suitable legislation directed to this purpose be enacted, therefore be it

RESOLVED, that the American Public Health Association recommend to the Congress of the United States that legislation requiring the pretesting and approval, before use, of food additives not now covered by the Federal Food, Drug, and Cosmetic Act, or other federal acts, be enacted without delay.

Commendation of Health Policy of National Congress of Parents and Teachers

WHEREAS, the National Congress of Parents and Teachers has shown a vital interest in the health of school children and has actively promoted the development of strong school health programs since the inauguration of the Summer Round-Up Program in in 1925, and

WHEREAS, the National Congress of Parents and Teachers has always attempted to support programs that effectively use existing community health resources, and

WHEREAS, the National Congress of Parents and Teachers, as a lay group, has always sought counsel from professional groups interested in school health in forming their programs and projects, therefore be it

RESOLVED, that the American Public Health Association commend the National Congress of Parents and Teachers for adopting a policy "supporting and encouraging a program of continuous health supervision of children from birth through their school experience" and urging their local Parent-Teachers Association to inaugurate "a promotional and educational program that will tend to bring children and their parents into effective contact with the health resources of the community."

Resolution on Implementation of Federal Occupational Health Activities

WHEREAS, The American Public Health Association previously has emphasized the need for occupational health programs required to support the economy and defense of the nation, and

WHEREAS, scientific and technologic progress are multiplying the health hazards of employed persons, and

WHEREAS, concerted action of governmental occupational health officials and the many disciplines concerned are essential to effective occupational health programs, therefore, be it

RESOLVED, that more adequate funds be provided for the Public Health Service Occupational Health Program, and for stimulating and strengthening state and local occupational health programs, and be it further

RESOLVED, that the American Public Health Association offer the expert resources of the Association to appropriate legislative committees for the development of legislation and for the support of appropriations for expanding occupational health programs.

Federal Aid to Graduate Schools of Public Health

WHEREAS, the American Public Health Association has previously gone on record as favoring federal aid to graduate schools of public health, and

WHEREAS, legislation now pending in the Congress would provide such aid, therefore be it

RESOLVED, that the American Public Health Association reaffirm its previous action and direct its Association officers to take all appropriate steps to further the enactment of this or similar legislation.

Vesting of Retirement Rights

WHEREAS, in only a few of the larger states and in the federal government are the employers' contributions vested with the retirement system members, so that these members retain the retirement benefits of all or part of their employers' contributions in the event they resign before becoming eligible for retirement benefits, and

WHEREAS, it is believed that such vesting would make employment more attractive to the prospective employee, and be particularly pertinent in the field of public health where promotion and increased responsibility frequently necessitate moving to another jurisdiction, therefore be it

RESOLVED, that the American Public Health Association endorses the principle of vesting of retirement rights of public health personnel, and that the Association convey its views to the state and local retirement systems, to the constituent state health organization, and to appropriate national professional organizations.

Health Statistics

WHEREAS, the National Health Survey Act providing for a continuing survey and special studies to secure current statistical information on the amount, distribution, and effects of illness and disability in the United States was passed by the Congress in 1956, and

WHEREAS, the Public Health Service began the continuing collection of data through the nation-wide household survey in July, 1957, and is developing a program of special studies in the field of health statistics, and

WHEREAS, these new sources of health information can be useful in the appraisal and administration of public health programs, and contribute significantly to research in the health field, therefore be it

RESOLVED, that the American Public Health Association urge that all public and private agencies cooperate with and support this national health statistics program, and take cognizance of the results for administrative planning of health services in order that the needs of the population may be adequately met.

Tenth Anniversary of the World Health Organization

WHEREAS, in 1958, the World Health Organization will celebrate the tenth anniversary of its establishment, and

WHEREAS, during the decade in which it has given leadership in world health affairs great progress has been made in health everywhere, and

WHEREAS, the World Health Organization has accepted the invitation of the United States government to hold the Eleventh World Health Assembly and the Tenth Anniversary Commemorative Session in the United States in 1958, therefore be it

RESOLVED, that the American Public Health Association congratulate the World Health Organization on its great achievements and extend a cordial welcome to the Organization and to the delegates to the Tenth Anniversary Commemorative Session and the Eleventh World Health Assembly.

Eradication of Malaria

WHEREAS, the American Public Health Association in 1955 endorsed the global campaign for the eradication of malaria, and recommended cooperation of all private and governmental agencies, and

WHEREAS, for economic and technical reasons, it is essential that global eradication of malaria be completed within a few years, and

WHEREAS, the United States government is taking a direct part in eradication programs under International Cooperation Administration and is making substantial financial contributions to special funds of the Pan American Sanitary Organization and the World Health Organization for this purpose, therefore be it

RESOLVED, that the American Public Health Association applaud the role of the United States government in eradication programs and in providing financial contributions and call upon the United States government to continue to give vigorous and continued support to malaria eradication both financial and technical until the goal has been achieved.

Appreciation to the Press, Radio, and Television Networks

WHEREAS, the press, radio, and television networks, national, state, and local, have carried to the people of America the news of the important events of the Eighty-Fifth Annual Meeting, thereby extending the value of the meeting to those unable to attend, therefore be it

RESOLVED, that the American Public Health Association acknowledge its indebtedness and extend its thanks to the officials and staffs responsible for these means of mass information.

Appreciation to Exhibitors

WHEREAS, the excellent exhibits, both scientific and technical, as presented at the Eighty-Fifth Annual Meeting are of unusual interest and value to the public health profession, and

WHEREAS, the exhibits contribute so materially to the success of the meeting, therefore be it

RESOLVED, that the American Public Health Association express its grateful appreciation to those who have presented these exhibits.

Appreciation to Officials and Groups

WHEREAS, the success of this Eighty-Fifth Annual Meeting is due in large part to the many courtesies, generous contributions of time and energy, and efficiency in providing for and conducting this meeting, as extended by J. Glen Smith, M.D., General Chairman of the Cleveland Committee, and his colleagues on the committee, and

WHEREAS, the meeting was made more enjoyable for all those attending by the gracious hospitality shared with us, therefore be it

RESOLVED, that the American Public Health Association express its grateful appreciation and warm thanks to Dr. Smith, to the Cleveland Committee, and to all those assisting him and the committee.

Appreciation to the Cleveland Health Department Staff

WHEREAS, J. Glen Smith, M.D., Commissioner, and the other members of the Cleveland Health Department have willingly and cheerfully accepted as another one of their official duties in an already imposing array of responsibilities the task of making the Eighty-Fifth Annual Meeting a smooth running and effective congress for the benefit of the entire profession, therefore be it

RESOLVED, that the American Public Health Association express its sincere appreciation and thanks to Dr. Smith and his staff of the Cleveland Health Department for their generous contributions of time and energy which have been so important in making the Eighty-Fifth an outstanding Annual Meeting.

Gratitude for Privileges Received

WHEREAS, the Eighty-Fifth Annual Meeting has been privileged to see at firsthand scientific and industrial features of Cleveland, thereby receiving much of interest and value, therefore be it

RESOLVED, that the American Public Health Association express its sincere thanks to the agencies of the Cleveland area and its environs, and to those industrial organizations that have made their services and facilities available for the special benefit of members.

Contribution of Dr. Reginald M. Atwater

WHEREAS, The American Public Health Association suffered on October 18, 1957, the irreparable loss of Dr. Reginald M. Atwater, its Executive Secretary;

WHEREAS, Dr. Atwater, during 22 years of outstanding service, guided the Association with remarkable courage, vision, and foresight during this period of development to

a position of tremendous influence throughout the world, and

WHEREAS, Dr. Atwater administered the affairs of the Association with practical sense and a spiritual devotion to public health through which the Executive Secretaryship became one of the most honored and respected positions in public health, be it

RESOLVED, that the American Public Health Association permanently record its everlasting debt to Dr. Reginald M. Atwater for his unselfish work and inestimable contribution to the growth and development of the Association and to the cause of public health.

In Memoriam

WHEREAS, since the Eighty-Fourth Annual Meeting of the American Public Health Association there has been recorded the irreparable loss of 102 Fellows and members, all of whom have been cherished participants in this professional society, many having made outstanding contributions to the success of the Association, therefore be it

RESOLVED, that the Association express its deep regret at this loss, and be it further

RESOLVED, that the attached list of those deceased constitute a part of this resolution.

Deceased Members and Fellows November, 1956, to October, 1957

Name	Member	Fellow	
Reginald Myers Atwater, M.D., Dr.P.H., Bronxville, N. Y.	1927	1935	
Carlton J. Austin, Newtown Square, Pa.	1943	1952	
Helen M. Baukin, D.H., Beloit, Wis.	1934	1941	
Frederick R. Bausch, M.D., Allentown, Pa.	1943		
Nell V. Beeby, R.N., New York, N. Y.	1949		
Rhoda W. Benham, Ph.D., New York, N. Y.	1931	1937	
Irma Biehusen, M.P.H., Milford, Conn.	1943		
Alma Blum, Newfield, N. Y.	1948		
Edward V. Bondolfi, M.P.H., Centerville, Calif	1953		
Jay I. Boxer, Hicksville, N. Y.	1944	1949	
Leverett D. Bristol, M.D., Harrisburg, Pa.	1914	1922	Charter
Dr. George F. Buchan, London, England		1928	Honorary
Emmett E. Byrd, M.D., Jonesboro, Tenn.	1955		
Mrs. Rhea P. Chandlee, Buffalo, N. Y.	1951		
Eugene O. Chimene, M.D., Jackson Heights, N. Y.	1930		
R. A. Clanton, M.D., Grenada, Miss.	1948		
Hubert D. Crow, M.D., Suffolk, Va.	1946		
Walter R. deForest, M.D., Hamilton, Ohio	1946	1952	
William DeKleine, M.D., Buffalo, N. Y.	1915	1922	Charter
Walter M. Dickie, M.D., Ph.D., Berkeley, Calif.	1936		
Burke Diefendorf, M.D., Glens Falls, N. Y.	1932	1941	
Robert Elman, M.D., St. Louis, Mo.	1956		
Haven Emerson, M.D., New York, N. Y.	1914	1922	Charter
William H. Enneis, M.D., M.P.H., Knoxville, Tenn.	1927		
Lynn H. Enslow, New York, N. Y.	1925	1930	
Franklin A. Ferguson, M.D., Portland, Me.	1912		
Louis Findlay, M.B., Reading, Berks, England	1954		
Gunnar A. Fischer, Tomteboda, Sweden	1948		
Walter Foote, Elmhurst, Ill.	1946		
Ola K. Gant, Ph.D., Arlington, Calif.	1949		
John W. Gilmore, M.D., Wheeling, W. Va.	1945	1951	
Thomas J. Goodfellow, M.D., Saratoga Springs, N. Y.	1937		
Arthur Gordon, Chicago, Ill.	1950		
Alan Gregg, M.D., Big Sur, Calif.	1937		
Bell Greve, Cleveland, Ohio	1955		
George W. Grim, V.M.D., Ardmore, Pa.	1922	1926	
Donald A. Grover, Battle Creek, Mich.	1944		
Frances F. Hagar, R.N., Nashville, Tenn.	1932	1934	
Walter H. Hartung, M.D., Toledo, Ohio	1935	1938	
Barton F. Hauenstein, M.D., Orchard Park, N. Y.	1939		
Charles M. Herrick, C.E., Washington, D. C.	1919		
Emil J. C. Hildenbrand, M.D., Washington, D. C.	1956		
Murray P. Horwood, Ph.D., Cambridge, Mass.	1914	1922	Charter

Deceased Members and Fellows November, 1956, to October, 1957—Continued

Name	Member	Fellow	
William L. Hughes, Ph.D., Philadelphia, Pa.	1936	1943	
Walter C. Humbert, M.D., Greenville, N. C.	1940	1948	
W. A. Jamieson, Sc.D., Indianapolis, Ind.	1923	1934	
Helen Johnson, R.N., Bethesda, Md.	1940		
James E. Johnson, M.D., Fort Smith, Ark.	1944		
Burton K. Kilbourne, M.D., Hardin, Mont.	1919	1929	
Henry R. Kraybill, Ph.D., Chicago, Ill.	1943	1949	
L. H. Lee, M.D., Los Angeles, Calif.	1938		
Theresa U. Lenthall, M.D., Cleveland, Ohio	1948		
Carroll F. Leonard, M.D., M.P.H., East St. Louis, Ill.	1946		
J. E. Lester, M.D., Marietta, Ga.	1937		
Arthur E. Lien, M.D., Spokane, Wash.	1935	1940	
Lawrence F. Lindgren, Lincoln, Neb.	1928		
Archibald F. Mackay, M.B., Oshawa, Ont. Canada	1948		
Thorvald Madsen, M.D., Copenhagen, Denmark		1927	Honorary
John F. Mahoney, M.D., New York, N. Y.	1939	1941	
John W. McClane, Sr., M.D., Fernandina Beach, Fla.	1945		
Roy W. McGee, M.D., Atlanta, Ga.	1946		
John O. McNeel, M.D., St. Louis, Mo.	1949	1953	
Edward L. Merritt, M.D., Fall River, Mass.	1932		
Homer R. Mitchell, Dallas, Tex.	1956		
Myron S. Mitchell, M.D., Brooklyn, N. Y.	1943		
G. McF. Mood, M.D., Charleston, S. C.	1919		
James P. Moon, M.D., Winchester, Tenn.	1950		
George Nenner, M.D., New York, N.Y.	1953		
Bernice E. O'Brien, Dayton, Ohio	1942	1952	
George B. Pantera, M.D., Hamburg, N. Y.	1956		
Elizabeth I. Parsons, D.Sc., Chamblee, Ga.	1928	1947	
John P. Peters, M.D., New Haven, Conn.	1949		
Lawrence J. Peterson, M.S.P.H., Berkeley, Calif.	1930	1938	
Gertrude Pienta, Lansing, Mich.	1940		
James D. Purvis, M.D., M.P.H., Camp Hill, Pa.	1952		
Sophie Rabinoff, M.D., New York, N. Y.	1931	1935	
Jackson T. Ramsaur, M.D., Gastonia, N. C.	1946		
Rollin A. Raymond, Wichita, Kans.	1947		
Charles R. Rein, M.D., New York, N. Y.	1936	1948	
Ralph A. Reynolds, M.D., San Francisco, Calif.	1930		
Amy E. Rogers, Phoenix, Ariz.	1946		
Joseph J. Saia, M.D., Tacoma, Wash.	1943		
Leo Francis Schiff, M.D., Plattsburgh, N. Y.	1925	1951	
Henry W. Schoenlein, M.S., Detroit, Mich.	1943	1949	
Henry Sigerist, Pura, Ticino, Switzerland		1955	Honorary
Edward M. Smith, Jr., M.D., Norfolk, Va.	1955		
William P. Smith, Cranford, N. J.	1948		
Russell S. Spaulding, Concord, N. H.	1949		
V. C. Stebnitz, Ph.D., Chicago, Ill.	1952		
Hugh J. Stennis, M.D., Abilene, Tex.	1956		
Bernhardt J. Stern, Ph.D., New York, N. Y.	1949		
Harry P. Stimson, D.O., Highland Park, Mich.	1946		
Fred W. Tanner, Ph.D., Winter Park, Fla.	1914	1922	Charter
Ludwig Teleky, M.D., New York, N. Y.	1941		
Thomas Tetreau, M.D., Portland, Me.	1912	1922	Charter
Harold G. Trimble, M.D., Oakland, Calif.	1934	1949	
Dr. Jan Harm Tuntler, Groninger, Holland	1946		
Frederick J. Wampler, M.D., M.P.H., Bridgewater, Va.	1927	1929	
Max Weiner, D.M.D., Rego Park, N.Y.	1949		
Peter Wenger, M.D., Fort William, Ont., Canada	1956		
C.-E. A. Winslow, Dr.P.H., New Haven, Conn.	1902	1922	Charter
Edith F. Young, M.D., Marysville, Calif.	1940		

NEWS OF AFFILIATED SOCIETIES AND BRANCHES

Connecticut Discusses New Areas

The annual meeting of the Connecticut Public Health Association in Newtown on November 21, 1957, was devoted to two of the newest problems of public health—the use, control, and effects of radiation and the rehabilitation of the hospitalized mentally ill. Among those speaking on the former were Ernest C. Pollard of Yale's Department of Biophysics; S. Allan Lough, Ph.D., of the U. S. Atomic Energy Commission; and Henry J. Marx, coordinator of atomic development activities. The second subject was presented by Francis J. Braceland, M.D., director of the Hartford Institute of Living, and Elias J. Marsh, M.D., state mental health commissioner.

Reported on at the meeting was the Association's public health careers' exhibit shown first at the New England Counseling and Personnel Conference in Hartford, the end of October (A.J.P.H. Dec., 1957, p. 1593). This exhibit is being displayed at various meetings throughout the state and in various high schools as a part of "Careers Day." The exhibit consists of three panels emphasizing that "public health provides a satisfying future of service, education, community participation, and personal satisfaction" and urging youth to "choose a career in public health." The Connecticut Association is one of three State Affiliates that have reported having health careers committees.

A change in by-laws provides for more continuity and direct election of the Nominating Committee. This committee of six members, heretofore appointed by the president, will now be elected for three-year, overlapping terms.

The annual C.-E. A. Winslow Award was presented to State Health Commissioner Stanley H. Osborn, M.D., for "superior service in the interest and betterment of public health." Dr. Osborn has the longest service as commissioner among the 48 state health officers.

Leonard F. Menczer, D.D.S., public health dentist of the Hartford Health Department, was succeeded in the presidency by Eric W. Mood, M.P.H., director, Bureau of Environmental Sanitation, New Haven Health Department. Other newly elected officers are:

President-Elect—Martha L. Clifford, M.D., M.P.H., chief, Community Health Services, State Department of Health

Vice-President—Stanley E. Wedberg, Ph.D., assistant professor of bacteriology, University of Connecticut

Treasurer—Eloise Eckler, chief nutrition consultant, State Department of Health

Secretary—E. Louise Ratcliff, M.P.H., health educator, New Haven Tuberculosis and Health Association

They are each Members or Fellows of the American Public Health Association.

Florida Has a Home Talent Program

The 29th annual meeting of the Florida Public Health Association was held in Fort Lauderdale, October 31–November 2. The theme, "Living In Later Years," was also the title of the presidential address by retiring president Bertha C. King, R.N., director of nursing of the Hillsborough County Health Department. More than 700 persons attended the meeting, an increase of about 13 per cent over the 1956 attendance. Of the 80 persons on the program, all but ten were Florida talent.

The main subject was discussed in two half-day general sessions. One was a panel moderated by John J. Wright, M.D., professor of public health administration, University of North Carolina School of Public Health. In 12 ten-minute talks as many aspects of the "Problems of the Aged" were explored

with questions from the audience directed to the panel. The opening general session included the presidential address, one on "Rehabilitation of the Aged" by Josephine J. Buchanan, M.D., chief of the Department of Physical Medicine and Rehabilitation, Columbia Hospital, Washington, D. C., and one on "Preparation for Maturity" by Howard Ennes, director, Bureau of Public Health, Equitable Life Assurance Society of the United States. A joint meeting of the Nursing and Health Education Sections saw the American Wing Community play, "The Room Upstairs," on the problems of the aging.

At a third general session Paul Lemkau, M.D., professor of public health administration, Johns Hopkins School of Hygiene and Public Health, discussed "Public Health Departments' Contribution to Mental Health." He also addressed a meeting of mental health staffs on "Mental Health Professionals in Public Mental Health." A joint meeting of the Health Officer and Mental Health Sections was devoted to recent developments and the future outlook in mental health programs, coordination of nursing and mental health programs, the role of the health officer, and planning for a mental health program in a county health department, the last-named by sociologist Earl L. Koos, Ph.D., of the University of Florida.

A special resolution of appreciation in honor of George A. Damé, M.D., for his 13 years of service as director of the state's Bureau of Local Health Services was passed. Local health officers and other public health workers of the state "have come to regard him as a tower of strength and authority." His services as three-time president of the Florida Academy of Preventive Medicine, president of the Association of State and Territorial Directors of Local Health Services, and leader in the founding and of serving as the first president of the American College of Preventive Medicine were also cited.

Newly elected officers are:

President—Fred B. Ragland, director, Bureau of Finance and Accounts, State Health Department

Vice-Presidents—A. Y. Covington, M.D., director, Bradford County Health Department; Carolyn Roth, assistant director of laboratories, State Health Department

Secretary—Nathan J. Schneider, Ph.D., assistant director, Bureau of Laboratories, State Health Department

Treasurer—Frances E. Chappell, clerk, Hillsborough County Health Department

Delegate to the Governing Council, APHA—Wilson T. Sowder, M.D., State Health Officer

Western Branch and Canada to Meet

For the first time since 1948 the Western Branch of the APHA and the Canadian Public Health Association will hold a joint session in 1958. Meeting in Vancouver, B. C., May 19–23, they will be joined by the British Columbia Public Health Association. The momentous occasion of the 1948 meeting was the first announcement by the then Canadian minister of health of the establishment of a federal health grants program to aid the development of public health facilities in the provinces.

The special occasion adding to the 1958 meeting is the centenary of British Columbia and the centennial festivities. President of the Western Branch is George R. F. Elliot, M.D., British Columbia provincial health officer.

Virginia Tells Members About 85th

The News Letter of the Virginia Public Health Association devotes its fall, 1957, issue largely to the 85th Annual Meeting of the American Public Health Association. Here, in excellent clipsheet fashion, are reported a variety of highlights—new officers, new Affiliates, the awards, the closed television circuit discussion on coronary disease, the Russian

visitors, summaries of some of the talks, the Cleveland Museum, and interestingly enough, a piece on how the mechanics of staging helped to make programs effective and, of course, a full story of the part Virginians played in the meeting. All is written with a light and often humorous touch.

APHA AFFILIATED SOCIETIES AND BRANCHES

Society and Secretary

ALABAMA PUBLIC HEALTH ASSOCIATION, George V. Truss, P.O. Box 2591, Birmingham 2
ARIZONA PUBLIC HEALTH ASSOCIATION, Goldie Gold, Maricopa County Health Dept., Phoenix
ARKANSAS PUBLIC HEALTH ASSOCIATION, Mrs. Vada Russell, State Health Dept. Bldg., Little Rock
CALIFORNIA, NORTHERN, PUBLIC HEALTH ASSOCIATION, Emanuel H. Pearl, 2220 Moorpark Ave., San Jose 28
CALIFORNIA, SOUTHERN, PUBLIC HEALTH ASSOCIATION, Byron O. Mork, M.D., University of California at Los Angeles, Los Angeles
COLORADO PUBLIC HEALTH ASSOCIATION, Margaret D. Lewis, 659 Cherokee St., Denver
CONNECTICUT PUBLIC HEALTH ASSOCIATION. E. Louise Ratcliff, M.P.H., Griffin Hospital, Derby
CUBAN PUBLIC HEALTH SOCIETY, Dr. Raphael Calvo Fonseca, Calle 19 No. 511 Altos Vedado, Havana
FLORIDA PUBLIC HEALTH ASSOCIATION, Nathan J. Schneider, Ph.D., P. O. Box 210, Jacksonville
GEORGIA PUBLIC HEALTH ASSOCIATION, Carl Fox, 33 Pryor St., N.E., Atlanta
IDAHO PUBLIC HEALTH ASSOCIATION, Wesley O. Young, D.M.D., P. O. Box 640, Boise
ILLINOIS PUBLIC HEALTH ASSOCIATION, William J. Hixon, Evanston Health Dept., Evanston
INDIANA PUBLIC HEALTH ASSOCIATION, Hester Beth Bland, 1330 W. Michigan St., Indianapolis
IOWA PUBLIC HEALTH ASSOCIATION, Mary L. Wombacher, State Dept. of Health, Des Moines
KANSAS PUBLIC HEALTH ASSOCIATION, Evelyn Ford, State Board of Health, State Capitol, Topeka
KENTUCKY PUBLIC HEALTH ASSOCIATION, Mrs. Rosalie Walters, 620 S. Third St., Louisville 2
LOUISIANA PUBLIC HEALTH ASSOCIATION, Mrs. Lucille Sawyer, Shreveport
MASSACHUSETTS PUBLIC HEALTH ASSOCIATION, Mrs. Elizabeth K. Caso, Dept. of Health, Cambridge
MICHIGAN PUBLIC HEALTH ASSOCIATION, Maurice J. Mayer, 405 Hollister Bldg., Lansing
MINNESOTA PUBLIC HEALTH CONFERENCE, D. S. Fleming, M.D., State Dept. of Health, University Campus, Minneapolis
MISSISSIPPI PUBLIC HEALTH ASSOCIATION, H. E. Boone, P. O. Box 1700, Jackson
MISSOURI PUBLIC HEALTH ASSOCIATION, Mrs. Nadia Craver, 5th Fl., State Office Bldg., Jefferson City
MONTANA PUBLIC HEALTH ASSOCIATION, Emma Wright, Box 811, Harve
NEBRASKA PUBLIC HEALTH ASSOCIATION, Matilda McIntire, M.D., Omaha-Douglas County Health Dept., Omaha
NEW MEXICO PUBLIC HEALTH ASSOCIATION, Robert Howell, 305 Terrace Ave., N. E., Albuquerque
NEW YORK CITY, PUBLIC HEALTH ASSOCIATION OF, Joseph Kadish, 164 W. 174th St.
NEW YORK STATE PUBLIC HEALTH ASSOCIATION, Mary C. Egan, State Dept. of Health, 333 E. Washington St., Syracuse 2, N. Y.
NORTH CAROLINA PUBLIC HEALTH ASSOCIATION, R. W. Brown, Bucombe County Health Dept., Asheville
NORTH DAKOTA PUBLIC HEALTH ASSOCIATION, Jean E. Norton, R.N., Box 133, Bismarck
OHIO PUBLIC HEALTH ASSOCIATION, Virginia Jones, Ohio Dept. of Health, Dayton
OKLAHOMA PUBLIC HEALTH ASSOCIATION, Marjorie Butler, 3400 North Eastern, Oklahoma City
OREGON PUBLIC HEALTH ASSOCIATION, T. M Colasuonno, M.D., State Board of Health, Portland
PENNSYLVANIA PUBLIC HEALTH ASSOCIATION, Robert H. Conn, 303 N. Second St., Harrisburg
PUERTO RICO PUBLIC HEALTH ASSOCIATION, Margarita Martines, Apartado 211, San Juan 2
SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION, Laura M. DeMarse, State Health Dept., Columbia
SOUTH DAKOTA PUBLIC HEALTH ASSOCIATION, Louis E. Remily, State Dept. of Health, Pierre
TENNESSEE PUBLIC HEALTH ASSOCIATION, C. B. Tucker, M.D., State Dept. of Health, 420 Sixth Ave., N., Nashville
TEXAS PUBLIC HEALTH ASSOCIATION, H. E. Drumwright, 3900 Lemmon Ave., Dallas
UTAH PUBLIC HEALTH ASSOCIATION, Mrs. Virginia Cole, City Health Dept., 115 S. State St., Salt Lake City
VIRGINIA PUBLIC HEALTH ASSOCIATION, William A. Dorsey, P. O. Box 2088, Richmond
WASHINGTON STATE PUBLIC HEALTH ASSOCIATION, Kathleen Burwell, R.N., State Dept. of Health, Smith Tower, Seattle
WEST VIRGINIA PUBLIC HEALTH ASSOCIATION, Paul B. Shanks, State Health Dept., Charleston
WISCONSIN ASSOCIATION FOR PUBLIC HEALTH, Paul Weis, 1 W. Wilson St., Madison
SOUTHERN BRANCH, A.P.H.A., Mary Irene Cummins, Box 323, Harriman, Tenn.
WESTERN BRANCH, A.P.H.A., Mrs. L. Amy Darter, State Dept. of Health, 2151 Berkeley Way, Berkeley, Calif.

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EMPLOYMENT SERVICE

The following pages present information for those seeking public health personnel and for those seeking positions in public health. Other information concerning vacancies and personnel available is on file in the Association office. Anyone wishing to have the benefit of this additional information can obtain it by writing to the Vocational Counseling and Placement Service of the Association.

Advertising space in these pages is available at special rates for the use of employers or individuals. The charges are $5 for the first 50 words or fraction thereof and $1 for each additional 10 words or fraction thereof. There is no charge to members or Fellows of the Association who desire to utilize the **Positions Wanted** portion of these pages. **Closing date** for receipt of advertisements is the first of the month preceding the desired month of publication. **All correspondence should be sent to the American Public Health Association, 1790 Broadway, New York 19, N. Y.**

POSITIONS AVAILABLE

Psychiatrist—Requires medical degree with specialty in psychiatry. Salary $11,772–$13,536. Position with State Health Department, Denver, Colo. Write to Dalton Roberts, Chief, Administrative Services, Colorado State Department of Public Health, 420 State Office Bldg., Denver 2, Colo.

Public Health Physician (L.H.O. III)—Position immediately available in Topeka City-Shawnee County, Topeka, Kans. Vacancy exists for full-time director-health officer of well established, well staffed city-county health department. Eligibility to practice medicine in Kansas, M.P.H. degree, plus experience and eligibility for certification by Board of Preventive Medicine desired. Civil service, Social Security, and retirement plan available. Salary range $11,000–$14,000 per annum. For further information write V. M. Winkle, M.D., State Department of Health, State Office Bldg., Topeka, Kans.

Public Health Physician (District Health Officer)—State of Wisconsin. Two positions. One position includes 11 counties in north central part of state, headquarters Rhinelander. Second position includes eight counties in area bordering Lake Michigan, north of Milwaukee, headquarters Fond du Lac. Act as medical administrator of district office; district epidemiologist; plan, organize, supervise work of district office personnel consisting of public health engineer, public health nurse, sanitarians, nutritionist, dental hygienist. M.P.H. degree plus three years' experience in public health administration; eligibility for a license in Wisconsin. Salary $11,592–$14,412 per year, plus travel allowance. Civil service, vacation, sick leave, Social Security, retirement benefits. Write Carl N. Neupert, M.D., State Health Officer, 400 State Office Bldg., Madison 2, Wis.

Public Health Physician (Epidemiologist)—Wisconsin State Board of Health, Madison. Plan, organize, and develop epidemiological studies and programs on a state level; participate and cooperate with state district health officers in field investigations. M.D., M.P.H. degrees, plus three years' experience in public health with emphasis upon epidemiology. Eligibility for a license to practice medicine in Wisconsin. Salary $11,592 with five annual increments to $14,412 per year, plus travel allowance. Civil service, vacation, sick leave, Social Security, and retirement benefits. Write Milton Feig, M.D., Director, Section on Preventable Diseases, State Board of Health, State Office Bldg., Madison 2, Wis.

Health Commissioner—City of 62,000. To direct and supervise all activities of the public health department and perform related work required. Graduation from recognized medical school; completion of approved internship and one year medical practice; and either one year public health training in approved public health school or three years' experience in public health administration required. Extensive knowledge of theory, principles, and practices of general and preventive medicine, public health, and administration preferred. Civil service status, 40-hour week, vacation, sick leave, medical and hospitalization insurance for the entire family, retirement plan. Salary range $10,680–$11,880, plus $65 per month car allowance. Apply Civil Service Commission, 7525 W. Greenfield Ave., West Allis 14, Wis.

Public Health Physician—for director of the Wood-Parkersburg Health Department, Parkersburg, W. Va. (Population 66,381.) Well qualified staff, including five public health nurses, two sanitarians, and two clerks. Salary range $10,800–$15,300, depending upon training and experience. Address inquiries to N. H. Dyer, M.D., M.P.H., West Virginia State Department of Health, Charleston 5, W. Va.

Chief, Division of Food and Sanitation—in health department of progressive Midwest city of 60,000. Responsible for slaughter-

house regulation, meat and milk inspection, and environmental sanitation. D.V.M. degree and public health experience required. Salary range $6,696–$7,896. Retirement plan and Social Security, and liberal hospitalization, sick leave, and vacation benefits. Write E. E. Bertolaet, M.D., Director of Health, City Hall, Kenosha, Wis.

Public Health Sanitary Engineer—$6,000–$8,000. **Public Health Educator**—$4,000–$6,000. Liberal expense allowances, pension, and Social Security, vacation and sick leave. Excellent working conditions with staff of 60 in the "Land of the Sky." Reply stating education and experience to Buncombe County Health Department, Box 7525, Asheville, N. C.

Public Health Nurse—The City of Santa Barbara invites applications. Salary $358–$436. Generalized program in beautiful city, mild climate, desirable living. Qualified person may begin above basic salary. Write Helen Hart, M.D., Health Department, 2 De la Guerra Plaza, Santa Barbara, Calif., or phone Woodland 6-7171, ext. 40.

Public Health Nurses—Livingston County, Mich., has need for two nurses with some training in public health to carry on a generalized public health nursing program in the county. Starting salary is $4,000 per year with travel. Personnel policies provide for vacation, sick leave, and Social Security. Write Dr. A. B. Mitchell, Director, Shiawassee-Livingston District Health Department, Howell, Mich.

Director of Nursing Division—Kalamazoo City-County Health Department. Beginning salary $5,500. B.S. degree in public health nursing and experience as nursing supervisor required. Five-day, 40-hour work week with liberal sick leave, vacation, and Social Security retirement benefits. To work in a community midway between Chicago and Detroit with many recreational and cultural facilities. Apply to Director, Kalamazoo City-County Health Department, City Hall, Kalamazoo, Mich.

Public Health Nurse—Opening for Public Health Nurse II. B.S. degree plus one year experience in established health department. Salary range $360 per month to $450 per month, plus liberal travel allowance. **Nurses** without experience and with degrees and public health training can qualify as Public Health Nurse II after one year of employment. Write to J. H. White, M.D., Director, Weld County Health Department, P. O. Box 521, Greeley, Colo.

Director of Nurses—for large, rapidly growing county (present population, 320,000) adjacent to Washington, D. C. New building, large staff. Requirements: Master's degree, plus five years of public health nursing experience, of which at least two years shall have been in a supervisory position. State Merit System, retirement, car furnished, salary open. Prince Georges County Health Department, Hyattsville, Md.

Qualified Public Health Nurse—Must be eligible for California certificate. Salary $376–$458; travel allowance for use of private car. Write to San Benito County Health Department, Health Center Bldg., Hollister, Calif.

Public Health Nurse—Salary $306.84–$381 per month. Position involves school nursing and is open to women 25–55 years of age who have qualifications equivalent to graduation from an accredited school of nursing and completion of a one-year course in an approved university curriculum in public health nursing, or two years of public health nursing experience. Applicants for this position must be licensed to practice nursing in the State of Illinois and must have a current Illinois public health nurse certificate. Write to the Rockford Civil Service Commission, 126 S. First St., Rockford, Ill.

Public Health Nursing Positions—Available in Health Department with the city of Flint, a rapidly growing city of 180,000 population. Beginning, intermediate, and administrative positions are available. Five-day, 40-hour week, with liberal retirement, vacation, and sick leave policies. Car furnished. Beginning salary rates: $3,952, $4,329, or $4,654, depending on experience and qualifications. Automatic increases and longevity rates for length of service. Apply Flint Civil Service Commission, City Hall, Flint, Mich.

Public Health Nurses—Salaries $315–$435 and **Graduate Nurses** $255–$370 for generalized public health nursing in New Mexico Department of Public Health. Opportunities for advancement, retirement plan, and other fringe benefits. Write Merit System Supervisor, Box 939, Santa Fe, N. M.

Public Health Nursing Positions—Must be licensed or eligible for license in New York State; public health nursing preparation required; city health department generalized program; 35-hour week, vacation, sick leave, and retirement policies; present salary range $4,360–$5,580, plus longevity increments of $250 at the end of 10, 15, and 20 years of service. Write Chester A. Hicks, M.D., Director of Public Health, New Rochelle, N. Y.

Wanted to fill three positions: (1) **Two Graduate Nurses**—for long-range research project on infant behavioral development. Duties include home and hospital interviews. Public health and interviewing experience desirable. Must be able to take responsibility. Beginning salary $4,260 per year. Forty hours a week. Must be able to drive a car. (2)

One Graduate Nurse—to record newborn activity on specialized equipment. Must be accustomed to handling newborns, have manual dexterity, and mathematical aptitude. Salary and hours as above. Apply to Clinic of Child Development, Children's Hospital, Columbus 5, Ohio.

Open to citizens of the United States who possess the minimum qualifications:

Medical Social Work Adviser (Female)—$5,096–$6,136.

Medical Social Worker (Female)—$4,472–$5,356.

Dietitian I (Female)—$4,264–$5,096.

Nurse Anesthetist (Female)—$3,900–$4,680.

Medical Technologist I—$3,588–$4,264. Write Personnel Director, Municipal Building, Hartford, Conn.

Opening available for **Medical Social Worker**—to establish and have charge of Social Service Department in modern 150-bed general hospital serving a medical population of 50,000. Salary commensurate with training and experience. Liberal personnel policies. Apply to Norman R. Brown, Administrator, Concord Hospital, Concord, N. H.

Psychiatric Social Worker—Requires master's degree with psychiatric sequence. Salary $442–$572. Position with State Health Department. Write to Dalton Roberts, Chief, Administrative Services, Colorado State Department of Public Health, 420 State Office Bldg., Denver 2, Colo.

Clinical Psychologist—Requires Ph.D. degree in clinical psychology and three years' clinical experience. Salary $510–$667. Position with State Health Department, Denver, Colo. Write to Dalton Roberts, Chief, Administrative Services, Colorado State Department of Public Health, 420 State Office Bldg., Denver 2, Colo.

Public Health Engineer—Salary range $712.83–$837.83. Qualifications: Bachelor's degree in engineering and four years' experience in public health engineering in a public health agency, or M.P.H. or M.S. and two years' experience in public health engineering. Duties: Direct Division of Environmental Sanitation in county of approximately 250,000. Annual vacations, sick leave, county retirement plan, and Social Security benefits. Apply: Director, Erie County Department of Health, 4728 Lake Pleasant Road, Erie, Pa.

Vital Statistician—Position open in Virginia State Department of Health. Qualifications require completion of a standard college course with major studies in mathematics, including at least six semester hours in statistics and three years of experience in technical statistical work, preferably in a public health agency. Experience in statistics may be substituted for education or graduate study in public health, including statistics, may be substituted for experience on an equivalent time basis, provided no substitution is made for the required courses in statistics. Position under merit system. Liberal vacation, sick leave, and retirement. Salary range $4,512–$5,640. For further information write, Director of Personnel, State Health Department, Richmond, Va.

Speech Therapist—Must meet certification by American Speech and Hearing Association. Modern well equipped Rehabilitation Center, pleasant surrounding and working conditions. Center located in growing community. Salary $3,600–$5,500 depending on experience. Rehabilitation Center for the Crippled, 316 Longwood Dr., S.W., Huntsville, Ala.

Public Health Nutritionist—Develop and conduct program in district area, including consultation to nurses, teachers, social workers, small hospitals, nursing homes, children's institutions; training programs; community studies and general nutrition education. Master's degree, internship, two years' hospital and community nutrition experience. $5,712–$6,852 plus travel expense. Vacation, sick leave, Social Security, retirement. Dr. Amy L. Hunter, State Board of Health, Madison, Wis.

Public Health Sanitarians—Salary range $5,296–$5,656 annually. Work in County Health Department, 17 miles from downtown Detroit. One day vacation and sick leave earned per month, liberal retirement benefits. Age not over 50. Training: B.S. in sanitary science or civil engineering with sanitary option; or B.S. degree in allied science, plus one year experience. Apply: Morton Hilbert, Chief Engineer, Wayne County Health Department, Eloise, Mich.

POSITIONS WANTED

On Box Numbers, Address APHA at 1790 Broadway, New York 19, N. Y.

Dentist—Whose background includes teaching, hospital training, administration, military, desires interesting position in the United States or foreign service. Additional background and references submitted on request. Write **Box D-17,** Employment Service, APHA.

Biostatistician, Ph.D.—Seeks university research affiliation; broad range of experience

and publications; development of meaningful statistical systems and designs for clinical evaluation; background of application in psychiatry, epidemiology, psychopharmacology, chemotherapy in tuberculosis, and general medicine. Write **Box ST-15**, Employment Service, APHA.

Health Educator—Mature woman, M.A., M.P.H. Excellent science background. Experience includes college teaching, public health, counseling. Desires position teaching school health, related subjects in college, university, or as director of health education for private organization. West, southwest, preferred; will go outside United States. Write **Box HE-86**, Employment Service, APHA.

Dr.P.H.—Seeks responsible position in health programing or as research coordinator. Offers excellent academic training and is experienced with voluntary and official health agencies. Background includes teaching experience in anatomy, biostatistics, epidemiology, and hospital administration. Write **Box C-34**, Employment Service, APHA.

Commercial Advertisements

All communications on the following commercial advertisements should be sent to Burneice Larson, Medical Bureau, Suite 605, 900 North Michigan Avenue, Chicago 11, Ill.

OPPORTUNITIES AVAILABLE

(a) Psychiatrist to head mental health program and public health physicians to direct crippled children, maternal and child health departments; duties entirely administrative and clinical consultations; outside U.S.; salary for psychiatrist, $20,000; for directors of services, $13,000–$15,000. (b) Health commissioner, county health department; full time cooperating unit; near small university center, Midwest; $15,000. (c) Public health physician; Pacific Islands; island has high school and college staffed with American teachers. (d) Epidemiologist; preventive medicine staff; foreign operations; leading industrial company; $14,000, plus $4,000 family maintenance; (federal tax free). (e) Student health physician; women's college; woman required; New England. (f) Professor and associate professor of public health administration and chairman of school of public health, university under American auspices; foreign country; department covers public health, administrative medicine, tropical health; students from 17 different countries; all teaching in English; travel provided for appointee and family. (g) Health educators and engineers; large department; West. (h) Sanitarian; degree in sanitary sciences, public health, or engineering, three years' experience required; foreign operations; major industrial company; $10,000–$12,000. (i) Director, public health nursing; resort area noted for its beauty and climate; California. (j) Public health mental health instructor; large university; East. (k) Head of public health nursing program; university under American auspices, foreign country; students from 13 countries; all instruction in English. (l) Public health nurse qualified nursing education or administration for overseas opportunities. (m) Director, public health nursing, large city, Michigan; $6,500–$7,900. (n) Assistant professor, public health nursing; large university, South. (o) Public health nurse to supervise outpatient clinic; 900-bed renowned teaching hospital; Midwest.

OPPORTUNITIES WANTED

WANTED—Opportunities for public health physicians, nurses, health educators, engineers, laboratory personnel. Candidates in all parts of the country available for administrative, academic, and staff appointments. Negotiations strictly confidential.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

Principles of Epidemiology—By Ian Taylor and John Knowelden. Boston, Mass.: Little, Brown (34 Beacon St.), 1957. 300 pp. Price, $9.00.

This little volume is welcome if for no other reason than that it is the first text on epidemiology in English since 1931. It has its own individual merit, particularly the sections on special surveys and the consideration of time and place relationships of community disease. The book is by two well known British epidemiologists. The senior author is in operational public health work; the junior author in academic education in public health.

The aim is a definition of epidemiologic principles with no attempt to describe the epidemiology of individual diseases. Examples are used liberally, however, in illustration of basic behavior of mass disease. The extent to which broad interest in epidemiologic practice has shifted from infectious to noninfectious disease is recognized in the preface, but has minor consideration in the text. The book is mainly concerned with the communicable diseases. The first fifth deals with statistical method and principle, material ordinarily considered in America as within the province of biostatistics. The statistical viewpoint runs through the text, in contrast to the biologic approach more usual in this country. Examples are almost wholly from British practice and reference is primarily to British work. American sources have good attention, but other countries almost none. Indeed, the international aspects of epidemiology, the comparison of disease behavior in tropics and arctic, and within varying social structures are largely missing.

Few divergences are noted between American and British opinion as to what constitutes principle. Direct droplet infection, however, is classed as a type of air-borne infection, although subsequently stated not to be true air-borne infection but a variety of contact infection, the usual American interpretation. The matter is more than academic, for the interpretation determines whether control is to be directed along engineering or public health lines.

The book will prove useful to many public health workers, perhaps more to the health officer than any other. The statistical start and lack of clinical emphasis will discourage many medical students. The graduate student will profit from the simple formulation of principles, although much of the material is below graduate levels of instruction; the concern is more with descriptive epidemiology than with the epidemiologic method as a means to research. The provincial limitation and the restriction to infective processes will disappoint some readers, but few will fail to profit.

JOHN E. GORDON

Medical Services for Rural Areas. The Tennessee Medical Foundation—By William A. Massie; Preface by Ralph H. Monger; and Introductory Note by Harry E. Handley. Cambridge, Mass.: Harvard University Press for the Commonwealth Fund, 1957. 68 pp. Price, $1.25.

This compact, attractively illustrated report of measures taken to rehabilitate the health services among coal mining areas of northeastern Tennessee emphasizes to us certain unique features of unusual interest. It demonstrates that under a policy of laissez-faire rural

communities in economically marginal areas almost inevitably fall far short of obtaining adequate medical service.

In this Tennessee story a most important step forward has been made through the formal acceptance of responsibility for leadership and the mobilization of financial assistance by organized medicine. Through the establishment of the Tennessee Medical Foundation by the State Medical Association, and with a financial grant from the Commonwealth Fund, and the cooperation of the United Mine Workers and the coal companies, seven communities were surveyed and expert guidance given them in developing general practice clinics. In one instance with Hill-Burton assistance a 43-bed hospital was constructed. Local enthusiasm and financial support were stimulated and young doctors and dentists enlisted to service communities previously lacking adequate medical and dental care.

The objectives of the Tennessee Medical Foundation are to: (1) extend medical knowledge, (2) advance medical science, (3) elevate the standard of medical education, and (4) prevent and cure disease. Here, therefore, organized medicine has accepted responsibility for applying the principles that education and research are necessary to sustain good levels of medical service even in an isolated, economically depressed area.

JEAN A. CURRAN

Teen-Agers and Alcohol—By Raymond G. McCarthy. New Haven, Conn.: Yale Center of Alcohol Studies (52 Hillhouse Ave.), 1956. 188 pp. Price, $4.00.

This handbook for the educator, prepared by the associate professor of health education at Yale University, can be recommended to all educators and citizens interested in the problem of the use of alcoholic beverages by teen-agers.

The use of alcoholic beverages in America is usually accompanied by extremes of emotional and moralistic thinking and approaches to the problem. The role of the schools in attempting to instruct students about the use of alcoholic beverages is complex and Dr. McCarthy calls specific attention to several important factors. Alcohol education should be integrated into the curriculum in an effective manner so as not to alarm the students or to cause unwarranted emotional reactions. Various technics for accomplishing such objectives are discussed in detail and are of value to educators.

The responsibilities of the schools to provide training for teachers engaged in instruction about alcoholic beverages and their usage, the correct grade placement of material, and cooperation with resources in the community are fully explained. The role of the teacher and relation to the family attitudes about the use of alcoholic beverages are also thoughtfully discussed. The administrative policy of the school authorities and its relationship to the support given to teachers in their efforts to integrate alcohol instruction into their curriculum is considered.

The book includes transcriptions of taped class discussions of the use of alcoholic beverages in six different grades and areas throughout the country. It contains pertinent information gathered from student opinions about alcohol and alcoholism and a discussion of the film "What About Drinking?"

While many educators have been reluctant to approach the task of teaching about the use of alcoholic beverages in the school system, Dr. McCarthy's book will serve a useful purpose in giving them a framework of reference for a correct approach. The problems involved in the use of alcoholic beverages, as well as the problem of alcoholism itself, are discussed factually and ob-

jectively and will prove of sound value to the interested reader.

While this book was intended primarily as a guide for teachers and educators, it is also of considerable merit to interested parents who wish to know the facts about this ever-present problem. Informed parents can be of value to their school system after gaining insight into the problem. Dr. McCarthy's approach to this problem is one of the few sound sources of information available today regarding this complex problem. JOSEPH P. VERDERY

Metropolitan Communities: A Bibliography—Prepared by the Government Affairs Foundation, Inc. Chicago, Ill.: Public Administration Service (1313 East 60th St.), 1956. 392 pp. Price, $10.00.

The explosive growth of cities, suburbs, and fringe areas and the problems arising therefrom, together with the current mood to examine critically the multiplicity, relationships, and efficiency of various government jurisdictions, gives timeliness to this bibliography on metropolitan communities "with special emphasis on government and politics."

There are more than 5,000 references in this bibliography divided into two main subjects," Government and Politics in Metropolitan Areas" and "Socio-Economic Background," each of three chapters with numerous subdivisions. For each of the many separate subjects there is a list of agencies and journals in the field as well as the references.

The sections on Health, Sewage and Other Waste Disposal, Water, Air Pollution, Housing and Urban Renewal of the chapter on Functions and Problems are particularly relevant to public health workers. For the section on Health the assistance of three Fellows and two staff members of the American Public Health Association is acknowledged.

The book was originally prepared as a working file for the staff of the Government Affairs Foundation and others who wished to consult it. It soon became evident that it had a wider usefulness. A preface is by Frank C. Moore, president of the Foundation, "organized to advance and improve the science of government and the administration of public affairs."

This volume might well be on every administrator's active bookshelf.

MARTHA LUGINBUHL

Change and Dilemma in the Nursing Profession—Studies of Nursing Service in a Large General Hospital—Edited by Leonard Reissman and John H. Rohrer. New York: Putnam's (210 Madison Ave.), 1957. 450 pp. Price, $6.80.

One of the five general hospitals in the United States having over 3,000 beds was the setting for the two nursing research projects reported here. The research was sponsored by the Louisiana State Nurses' Association, financed by the American Nurses' Association, and conducted by the Urban Life Institute, Tulane University.

The researchers were concerned with making a contribution to the understanding of the changing role of nurses and the conflict they experience between bedside care and administration, between values and practice. While undoubtedly achieving this objective, their research report also makes a further contribution to the understanding of how organization and administration affect personnel satisfaction and influence patient care.

Part I of the book describes studies of nurses and nursing activities in four hospital units—medical, surgical, central services, and personnel infirmary. These focus on such factors as patient care problems, interests, characteristics, relationships, and role perceptions of professional and nonprofessional nursing personnel.

A report of studies done in the Premature Infant Center comprises Part II. Most of this material was published in 1953 by the Urban Life Institute as a report to the Louisiana State Department of Health—"Nursing Services in a Premature Infant Center."

Appendixes account for more than 150 pages of the volume. They include a discussion of methodology, information about tests and test results, and a variety of supporting tables.

Some readers will undoubtedly consider the research diffuse; it is a complex subject dealt with in an extremely complex situation. There will be others who will be helped by this book to a clearer sense of direction for additional research and for improvement of administration and service in hospitals.

ELLWYNNE VREELAND

Closed Ranks. An Experiment in Mental Health Education — By Elaine Cumming and John Cumming. Cambridge, Mass.: Harvard University Press, 1957. 192 pp. Price, $3.50.

This experiment in mental health education carried out by a sociologist and a psychiatrist is of special interest in the way the failure of an experiment was turned into a productive experience through the study of the causes of failure, valuable to those interested in sociopsychologic research. The authors endeavored to understand and change attitudes toward mental illness through discussion and mass media in a small prairie community in Canada and used as a control a similar community in which attitudes were tested but without benefit of education. The program did not change attitudes but aroused anxiety and hostility toward the interviewers.

The community considered mental illness a stigma. The social response seems to be: denial of the illness, then isolation of the patient, belief in the efficacy of the hospital to cure if possible, denial that the problem concerns the ordinary citizen, and a half-hidden fear and rejection of the mentally ill and guilt over these feelings.

The failure was ascribed to the threat inherent in deviant behavior—"unpredictability and non-normativeness," to the fact that the program "implicitly reproved" people for isolating the mentally ill and that other attitudes were prescribed on the grounds "that the mentally ill are very little different from the mentally well." The reviewer does not believe that this would be accepted by the average person who judges by overt behavior and ideas or by most psychiatrists. Apparently the authors had not considered the relevance and importance of the already held opinions and were sure of the rightness of what they were teaching, but concluded "that the whole ethic underlying the attempt to change the attitudes of others should be kept constantly in sight." But this unfortunately was not explored. This research shows that the limits of education do not depend only on motivation and skill of presentation, but on the presence of resistance to change in the particular area.

FLORENCE POWDERMAKER

The Doctor, His Patient and the Illness—By Michael Balint. New York: International Universities Press, Inc. (227 West 13th St.), 1957. 355 pp. Price, $7.50.

This book describes and analyzes a research and training program developed at Tavistock Clinic, London, to study the psychologic implications in general practice and to prepare the general practitioner to deal with them. A series of weekly seminars was conducted by the author, a psychiatrist, with the participants presenting case histories for discussion. Dr. Balint clearly indicates the focus of the project in his choice of title, "The Doctor, His Patient and the Illness." The case dis-

cussions provided method and content for the group to study "the most frequently prescribed drug, the doctor" and to become aware of how its therapeutic potential could be enhanced; also to gain insight into the significance of the illness to the patient and doctor. The role of feelings, the doctors' and the patients', in determining action was repeatedly identified and tellingly interpreted in the discussions.

The training program has been considered to be such an important contribution to preventive mental health that the pattern has been followed at Tavistock for family caseworkers, pediatricians, public health nurses, and probation officers. The objective reporting of failure and success, and the analysis of the factors that affected the results of the project will be of particular interest to the individual or agency involved in training activities.

The final chapter discusses the consultative role of a mental health clinic.

Although Dr. Balint gears his discussion to psychiatry and general practice, it is timely and appropriate for practitioners in public and mental health.

RUTH E. SIMONSON

Industrial Deafness—By Joseph Sataloff. New York: McGraw-Hill (330 West 42nd St.), 1956. 333 pp. Price, $8.00.

Industrial noise and industrial hearing loss have recently received increasing attention. However, pertinent data have been scattered among acoustical, audiologic, industrial, and medical publications. This volume represents an attempt "to cover all phases of industrial deafness (and) to serve as a guide in solving the many problems facing industry." It does a commendable job in most respects.

The authors (four additional contributors have handled certain technical aspects of the noise problem) have steered an adroit path between factual data and assessment of limited knowledge, with clear indication as to which is which, and the bases upon which judgments have been made. Perhaps the weakest chapter is on "Damage Risk Criteria," where strong support is given to Beranek's criterion with negligible consideration of other criteria or the possible implications of the ASA Z24–X–2 report. The strongest chapters are those involving hearing testing, including an excellent discussion of audiometric testing technics.

A frustrating experience occurs as a result of the author's attempt to make the book readable by omitting references. For example, Miller's work on the annoying effects of noise is given considerable attention (pages 46–47), with almost two pages of quotations, yet the source of the quotations is given nowhere in the text or index for the interested readers to follow up. This situation occurs for other authors and experiments. This reviewer also questions the reproduction of all audiograms on a form upon which appears a notation giving the name of a particular audiometer model which, in fact, was not employed.

This volume should be read by all individuals concerned with the industrial hearing problem. It will be of especial value to those desiring an initial orientation in simplified form.

LEO G. DOERFLER

Heating. Ventilating. Air Conditioning Guide 1957 (35th ed.). New York: American Society of Heating and Air-Conditioning Engineers (62 Worth St.), 1957. 520 pp. Price, $12.00.

The general nature of this well established guide has been discussed in previous reviews appearing in the Journal (44, 10, page 137; 43, 10, page 1351; 41, 10, page 1299 and 39, 12, page

1589). Although the guide has been fully revised, several changes will be of particular interest to public health people. The chapter on sound control has been entirely rewritten and enlarged, including an increased list of basic terms and a fuller discussion of general theory of sound control. The chapter on codes and standards has been brought up to date with several new standards added. A new chapter, "Control of the Industrial Environment," will be of particular importance to anyone working in industrial hygiene. A new chart provides a means for combining information on the effect of various factors in a single term known as "heat stress index." Methods of controlling heat exposure are discussed. As in previous editions, the volume is divided into several sections. Section I, Fundamentals, and Section II, Human Reactions, will be especially interesting to public health workers. The total length of the volume has been increased to give more than 1,250 pages for a discussion of technical data. The catalogue data section now covers 337 manufacturers in more than 500 pages of discussion. Many new tables have been added to the volume. This should prove a valuable manual to those working in the fields covered by the text. FRANCIS B. ELDER

Organized Home Medical Care in New York City—A Study of Nineteen Programs by The Hospital Council of Greater New York. Published for the Commonwealth Fund by Harvard University Press, Cambridge, Mass., 1956. 538 pp. Price, $8.00.

To all of those considering the application of home care as a potentially effective, economic and humane way of meeting some of the needs of people with long-term illness, this report is a necessary reference. It was prepared by Dr. Peter Rogatz as study director for the Home Care Committee of the Hospital Council of Greater New York. The purpose of the report is "to review and assay one form of medical care . . . provided . . . on a more or less experimental basis." The review is carried out in great and often repetitive detail based upon field observations, analyses of records, interviews with plan administrators and, as a major contribution to the field, interviews with a sample of patients and their families. This material is viewed in general, then from the patient's point of view. This is followed by an administrative analysis and again discussed as the expert looks at community planning. A series of eight appendixes provide the reader with a sufficient share of the original working data to permit fairly independent analysis. There are chapter references and an excellent general bibliography. The contents are made more useful by a good index and a series of introductory paragraphs for each subdivision of the book.

The detailed assay offered of each program demonstrates the value of objective administrative review, and the special values of finding out what patients say. Strong points and weak points are described quite straightforwardly. The "evaluation" is also frank, but much more gentle. All recommendations are simply and clearly stated and can be readily interpreted for other geographical areas, with knowledge and understanding of local needs and resources. However, both the initial orientation and the objective materials of study lead almost inevitably to the conclusion that a complete home care program (in New York City) "can best be accomplished if the program is operated by a general hospital . . ." Many other communities will find this impractical or unsuited to their particular needs and, hopefully, will not feel bound by it. The stress upon the

place of home care in the context of total medical care, and generally on the quality of care is deserving of the emphasis given throughout the report.

This reviewer feels that the somewhat repetitious design of the report makes it a more useful reference work. Most readers will also be grateful for the clear and relatively jargon-free language, the use of paragraph and section headings, a comfortable type-face, uncluttered tables and a clean print job on glare-free paper (for the promotion of mental and physical health).

JONAS N. MULLER

Marriage—By Earl Loman Koos (rev. ed.). New York: Henry Holt (383 Madison Ave.), 1957. 344 pp. Price, $4.00.

Why review a book titled "Marriage" in this Journal? Well, marriage is a condition most of the public finds itself in for lengths of time which falls easily into our definitions of chronic. It exhibits various degrees of health, and community-wide marriages which are "unhealthy" affect all of us in the well known multitude of ways.

Should we, or can we in public health do anything about marriage? Koos's book is itself an affirmative answer. Not that it pleads any cause, but more usefully, it seems easily capable of achieving its author's stated purpose of stimulating an "objective view of what is necessarily a highly subjective phenomenon." While it is primarily aimed at those fortunate students who can take school courses in marriage or the family, the greater majority of us in public health who are not directly concerned with helping young people build an adequate philosophy of marriage will surely enjoy this revised edition which is still as emotionally and intellectually satisfying as was its predecessor, published in 1953.

Koos offers alternatives rather than any one view, steering consciously between Freud and sociology. He seeks discussion "points of entrance and exit," and finds them! He lightens the incorporation of recent research findings by judicious choice and placement of references and by succinct and telling illustrations from case records and histories.

The coverage is extensive, yet the style is refreshingly unpedantic. Chapters discuss physical and psychological qualifications for marriage, mate selection, courtship, the honeymoon, sexual aspects, economic aspects, religion, in-laws, children, marriage in a war-minded world, if marriage does not work, and growing old in marriage. Also included are a bibliography of textbook correlated and supplementary readings, a list of relevant motion pictures and their sources, an index of names, and an index of subjects.

Perhaps just because it is no treatise upon the family as an institution, but is rather focused upon the opportunities and responsibilities in marriage for so many in the United States today, this book has value for us in public health. Our encouragement of its widest use will pay rich and varied dividends.

IRVING S. SHAPIRO

Pediatrics—Edited by Donald Patterson and John Ferguson McCreary. Philadelphia, Pa.: Lippincott (East Washington Square), 1957. 654 pp. Price, $14.00.

This volume of some 650 pages, which includes the work of 36 authors who practice pediatrics or teach in a related field of medicine in Canada, should be an excellent reference volume for physicians who include children in their practice. Helpful aids in diagnosis and outlines of therapy are unusually clear considering the limited space in which the entire scope of pediatrics and normal growth are covered. As a quick reference this volume could serve well

as an encyclopedia on pediatrics. Rapid advances in such fields as virus diseases make it wise for a reader to consult current periodic scientific journals on such questions, however.

One of the outstanding values of this volume is the excellent advice given on the education of parents and the suggestions made by the authors and editors of helpful explanations to parents in regard to the care of their children in relation to illness and through stages of early development. Brief reference is made in appropriate chapters to social agencies and psychiatric clinics.

MARTHA L. CLIFFORD

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

APPRAISAL OF APPLICANTS TO MEDICAL SCHOOLS, THE. Edited by Helen Hofer Gee and John T. Cowles. Evanston, Ill.: Association of American Medical Colleges, 1957. 228 pp. Price, $3.00 cloth; $2.00 paper.

BEHIND LOCKED DOORS. R. Vera Bereslavsky. New York: Pageant Press, 1957. 303 pp. Price, $4.00.

BIOLOGICAL EFFECTS OF WHOLE-BODY GAMMA RADIATION ON HUMAN BEINGS. Harold O. Davison. Baltimore, Md.: Johns Hopkins Press, 1957. 101 pp. Price, $3.00.

BRIGHTER TOMORROW. Frederica Johnson. New York: Pageant Press, 1957. 170 pp. Price, $2.75.

CARDIOVASCULAR REHABILITATION. Paul Dudley White; Howard A. Rusk; Bryan Williams; and Philip R. Lee. New York: McGraw Hill, 1957. 155 pp. Price, $6.50.

CELLULAR BIOLOGY NUCLEIC ACIDS AND VIRUSES. Monograph Dedicated to Basil O'Connor. V. G. Allfrey. New York: New York Academy of Sciences, Vol. V, 1957. 144 pp. Price, $10.20.

CHRONIC ILLNESS IN A LARGE CITY. CHRONIC ILLNESS IN THE UNITED STATES—VOL. IV. Commission on Chronic Illness—A Commonwealth Fund Book. Cambridge, Mass.: Harvard University Press, 1957. 620 pp. Price, $8.00.

CITY AND SUBURBAN HOUSING. The Reference Shelf, Vol. 29, No. 6. Edited by Poyntz Tyler. New York: Wilson, 1957. 190 pp. Price, $2.00.

CRITIQUE OF COMMUNITY PUBLIC HEALTH SERVICES, A. Part II, November, 1957, Journal of the A.P.H.A. New York: National Advisory Committee on Local Health Departments, National Health Council. 48 pp. Price, $.75.

DEAFNESS, MUTISM AND MENTAL DEFICIENCY IN CHILDREN. Louis Minski. New York: Philosophical Library, 1957. 82 pp. Price, $3.75.

DOCTOR AND PATIENT IN SOVIET RUSSIA. Mark G. Field. Cambridge, Mass.: Harvard University Press, 1957. 266 pp. Price, $5.00.

DON'T LET SMOKING KILL YOU! Clarence W. Lieb. New York: Bonus Books, 1957. 128 pp. Price, $.75.

ELECTROPHYSIOLOGY OF THE HEART, THE. Vol. 65, Art. 6, pp. 653–1146. Hans H. Hecht, et al. New York: New York Academy of Sciences, 1957. 1145 pp. Price, $4.50.

EMPLOYEE HEALTH SERVICES. A STUDY OF MANAGERIAL ATTITUDES AND EVALUATIONS. Conducted for the Public Health Service by the Institute for Social Research, University of Michigan, Ann Arbor. Washington, D. C.: Occupational Health Program, PHS, Department of Health, Education, and Welfare, 1957. 102 pp. Limited supply.

HISTORY OF NUTRITION, A. Elmer Verner McCollum. Boston, Mass.: Houghton Mifflin, 1957. 451 pp. Price, $6.00.

HUMAN SUM, THE. HOW MANY SHOULD WE BE? Edited by C. H. Rolph, et al. New York: Macmillan, 1957. 232 pp. Price, $3.75.

INTEGRATING THE APPROACHES TO MENTAL DISEASE. H. D. Kruse, Editor. New York: Hoeber, 1957. 393 pp. Price, $10.00.

INTERNATIONAL SANITARY REGULATIONS. WHO —ANNOTATED EDITION. New York: Columbia University Press, 1957. 129 pp. Price, $1.00.

MANUAL OF MICROBIOLOGICAL METHODS. So-

ciety of American Bacteriologists, Committee on Bacteriological Technic. New York: McGraw-Hill, 1957. 315 pp. Price, $5.50.

NEW FRONTIERS OF AGING, THE. Edited by Wilma Donahue and Clark Tibbitts. Ann Arbor, Mich.: University of Michigan Press, 1957. 209 pp. Price, $5.00.

NUCLEAR ENERGY IN THE SOUTH. Edited by Redding Sugg, Jr. Baton Rouge, La.: Louisiana State University Press, 1957. 151 pp. Price, $3.50.

OCCUPATIONAL OUTLOOK HANDBOOK. EMPLOYMENT INFORMATION ON MAJOR OCCUPATIONS FOR USE IN GUIDANCE. 1957 Edition. U. S. Department of Labor. Washington, D. C.: Gov. Ptg. Office, 1957. 697 pp. Price, $4.00.

OLDER PEOPLE AND THE INDUSTRIAL COMMUNITY. New York: National Committee on the Aging, 1957. 46 pp. Price, $1.00.

PARSON CLAPP OF THE STRANGER'S CHURCH OF NEW ORLEANS. Edited by John Duffy. Baton Rouge, La.: Louisiana State University Press, 1957. 191 pp.

PATIENT AND THE MENTAL HOSPITAL, THE. Edited by Milton Greenblatt; Daniel J. Levinson; and Richard H. Williams. Glencoe, Ill.: Free Press, 1957. 658 pp. Price, $6.00

POISON ON THE LAND. THE WAR ON WILD LIFE AND SOME REMEDIES. J. Wentworth Day. New York: Philosophical Library, 1957. 246 pp. Price, $6.00.

PSYCHIATRIC INPATIENT TREATMENT OF CHILDREN. J. Franklin Robinson, et al. Washington, D. C.: American Psychiatric Association, 1957. 214 pp. Price, $3.50.

PUBLIC HEALTH INSPECTOR'S HANDBOOK. Henry H. Clay and R. Williams. London, England: H. K. Lewis, 1957. 614 pp. £2. 0.0. net.

PUBLIC HEALTH NURSING PRACTICE. Ruth B. Freeman (2nd ed.). Philadelphia, Pa.: Saunders, 1957. 435 pp. Price, $5.00.

SCIENCE OF SKIN AND SCUBA DIVING, THE. ADVENTURING WITH SAFETY UNDER WATER. A Project of the Conference for National Co-Operation in Aquatics. New York: Association Press, 1957. 306 pp. Price, $3.95.

SCIENTIFIC STUDY OF SOCIAL BEHAVIOUR, THE. Michael Argyle. New York: Philosophical Library, 1957. 239 pp. Price, $6.00.

SECOND CONFERENCE ON SULFONAMIDES. Vol. 69, Art. 3, pp. 377–524. Perrin H. Long, et al. New York: New York Academy of Sciences, 1957. Price, $3.00.

SUBCELLULAR PARTICLES IN THE NEOPLASTIC PROCESS. Vol. 68, Art. 2, pp. 245–656. Cornelius P. Rhoads, et al. New York: New York Academy of Sciences, 1957. Price, $5.00.

TUBERCULOSIS: EVERY PHYSICIAN'S PROBLEM. J. Arthur Myers. Springfield, Ill.: Thomas, 1957. 290 pp. Price, $7.50.

VETERINARY TOXICOLOGY (formerly Lander's Veterinary Toxicology). B. J. Garner. Baltimore, Md.: Williams and Wilkins, 1957. 415 pp. Price, $7.50.

WORLD DIRECTORY OF MEDICAL SCHOOLS. WHO. New York: Columbia University Press, 1957. 210 pp. Price, $5.00.

ZINSSER'S BACTERIOLOGY. David T. Smith, et al. (11th ed.). New York: Appleton-Century-Crofts, 1957. 953 pp. Price, $12.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Raymond S. Patterson, Ph.D.

Those Hardy Females—In 1926 the average length of life of white females was 2.6 years longer than that of males, but in 1955 women lived 6.3 years longer than men. Two of the factors in this ever-growing divergence have been the marked reductions in maternal mortality and the sharp rise in fatal motor vehicle accidents among men, but each of the leading causes of death record greater improvements among female than male mortality rates. An outstanding example: an excess of female cancer mortality has been converted into an excess of male death rate—thanks to lung cancer.

ANON. Sex Differences in Mortality Increasing. Statist. Bull. Metrop. Life Insur. Co. 38, 9:1 (Sept.), 1957.

Centennial—Anyone with even the slightest yen for history will be delighted with these reminiscences culled from the British Medical Journal of a century ago. Speculation about the miasmatic fevers continued to play its usual part. Quackery and purging received a drubbing. Poor Florence Nightingale came in for her share of criticism and a proposal to train able-bodied female inmates of workhouses as nurses was mentioned as an antidote to Miss Nightingale's high-flown ideas. Our own Oliver Wendell Holmes is quoted in his warnings against the extention of the "skillful and narrow minded" specialization in medicine as a return to a "state of primitive Egyptian culture." On the health of children, as opposed to their illnesses, little is said—much more that is entertaining as well as illuminating is to be found.

BACON, L. J. Spotlight on 1856. Pub. Health 71, 7:244 (Oct.), 1957.

More Fluoridation Support—Here you will find, in a broad panel discussion, timely and basic comment on many phases of water fluoridation. Among them are: application of materials at constant and desired rates and persistance of fluoride concentrations throughout distributing systems. All the cities represented by the panelists (with the exception of New York) have had satisfactory experience in adding fluorine to water supplies.

BAYLIS, J. R., et al. Experience in Applying Fluorides. J. Am. Water Works A. 49, 10:1239 (Oct.), 1957.

Aiding the Elderly—Community plans involving interagency and multidisciplinary collaboration are now "in the works," and in a variety of situations and locations. Better preventive, nursing, and rehabilitative undertakings are being demonstrated and adopted. Restorative care, which presents many practical difficulties, is needed to make these services truly comprehensive. Perhaps no single service can do more to lessen the care that an elderly person will need than the provision of a hearing aid, a new pair of glasses, better fitting dentures, or the treatment of a painful bunion—the Surgeon General comments in passing.

BURNEY, L. E. Health Problems of the Aging. J.A.M.A. 165, 5:440 (Oct. 5), 1957.

Inspiration Here—There may be little that will be of great technologic help to you in your day-to-day job, but if you want to expose yourself to good writing and persuasive presentation then this essay would be hard to beat for that purpose. You will enjoy it and quite possibly may be inspired by it to try to make your next attempt at putting your ideas into print equally interesting and persuasive. The author is a writer as well as scientist—a still quite rare combination.

DAVIDSON, H. E. The Concept of Psychiatric Disability. New England J. Med. 257, 14:655 (Oct. 3), 1957.

Continued Story—In this prospective survey of mothers who had (diagnosed) rubella during the first trimester of their pregnancies, one in 10 of their live babies had congenital deformity—a much smaller incidence than those reported in retrospective surveys. However, it is still true that rubella does increase the likelihood of malformations, so susceptible female youngsters should be exposed to infection while they are young.

GREENBERG, M., et al. Frequency of Defects in Infants Whose Mothers Had Rubella During Pregnancy. J.A.M.A. 165, 6:675 (Oct. 12), 1957.

Prophylactic Note—Because of the considerable carrier rate and the relative resistance of hepatitis virus to heat and other sterilizing agents, it is recommended that all needles used in parenteral technics be sterilized in boiling water for 30 minutes, or for 20 minutes in steam under 15–20 pounds pressure, or in dry heat at 180° C for an hour.

HAVENS, W. P. Etiology and Epidemiology of Viral Hepatitis. J.A.M.A. 165, 9:1091 (Nov. 2), 1957.

Informed Teamwork—Each time any health worker takes a case history, observes changes in illness, draws a blood specimen, or notes relationships of exposure to clinical manifestations he is using the epidemiologic method. Many other categories of activity belong here, too, for epidemiology is concerned with all the factors that affect the occurrence of disease—physical or emotional. Epidemiologic method, then, is something with which all should be on speaking terms.

LESTER, M. R. Every Nurse an Epidemiologist. Am. J. Nursing 57, 11:1434 (Nov.), 1957.

Grass Roots Sanitation—In 1956 there were still—in these proud United States—eight million rural and two million urban dwellings lacking flush toilets. All the privies in Boston, Ga., were reconstructed by drilling deep holes and covering with a concrete slab equipped with an aluminum riser and lidded seat. (Typical cost $26.20.) Resulting diarrheal disease rates were half those in check towns.

MCCABE, L. J., and HAINES, T. W. Diarrheal Disease Control by Improved Human Excreta Disposal. Pub. Health Rep. 72, 10:921 (Oct.), 1957.

More Good Writing—Here is another persuasive exhortation to (Canadian) health officials to assume influential roles in a promising mental health program. Of course you are already converted to the thesis that mental health is an integral part of over-all public health, but you will still profit widely by this call to arms.

MCKERRACHER, D. G. Is Mental Disorder the Next Frontier for Public Health? Canad. J. Pub. Health 48, 10:426 (Oct.), 1957.

Advice to Proponents—You do not need to, and should not, deal with opponents of fluoridation. You must deal with that large group who are only peripherally interested and only partially informed. To reach them you must somehow involve them and become

involved with them. This, in barest essence, is the summation of a discussion of practical ways to win a referendum. (An Atlantic City meeting paper via Great Britain.)

METZNER, C. A. Referenda for Fluoridation. Health Ed. J. 15, 3:168 (Sept.), 1957.

About Drinking—In this "historical perspective" the author says: the law punished the crime of drinking to make the drinker abstain; the church preached against the immorality of drinking, declaring itself for abstinence; medicine treated symptoms and prescribed abstinence. We know how inadequately these forces have worked in past generations. The Yale plan, the author says, represents the most hopeful approach for research and teaching and is being widely copied. He concludes that for such a fundamental problem a panacea is unlikely. Incidentally, the problem may worsen thanks in part to shortening work weeks and resulting idleness.

MYERSON, D. J. The Study and Treatment of Alcoholism. New England J. Med. 257, 17:820 (Oct. 24), 1957.

Another O.K.—In Canada, too, paralytic poliomyelitis rates reveal a downward shift principally in the age-group of children (ages five–seven) that received vaccine—"confirmatory evidence of the effectiveness of the vaccine."

NELSON, A. J. Influence of Vaccination Upon Age Distribution of Poliomyelitis Canad. J. Pub. Health 48, 8:313 (Aug.), 1957.

Ragweed: P.H. Nuisance—On the assumption that home-grown ragweed hurts the hay fever sufferer most, Detroit has been carrying on a control program (that has produced satisfactory results) for some years. Based on this experience, the author concludes: "Control of ragweed by a weed spraying operation is the only feasible and practical method (and) must be a joint operation of the official agency responsible for public health and of other interested community groups."

RUSKIN, J. H. Hay Fever: An Evolving Problem for Sanitarians. The Sanitarian 20, 2:78 (Sept.–Oct.), 1957.

When Fear Ruled—This 125-year-old account of the sanitary reforms instituted by a hastily recruited (Scottish) Board of Health, when a cholera epidemic approached, is a historical gem. Pigs in dwelling houses, accumulated stable manure, smelly tan-yards, and an open sewer became the objects of the board's attention—until the epidemic reached town. Then individual, but ineffectual, preventive and treatment measures were directed to the victims-elect.

TAIT, H. P. The Cholera Board of Health: Edinburgh. 1831–1834. M. Officer 98, 17:235 (Oct. 25), 1957.

Flu in Asia—Presenting such data as could be assembled on the commencement of the Manila epidemic (early in 1957) this paper offers important epidemiologic help. About two in every five were laid low. Age and sex and social differences are tabulated and the attributable excess mortality rates are presented.

TABACK, M., and REYES, A. C. Philippine Influenza Epidemic in 1957. Pub. Health Rep. 72, 10:855 (Oct.), 1957.

Public Health vs. Glaucoma—"Tonometry is a valuable procedure in preventive medicine and should be a part of the routine physical examination of all individuals over 40 years of age." This recommendation concludes a review of wide experience in institutional and private ophthalmologic practice.

VAUGHAN, D. G., et al. Glaucoma Detection. Sight-Saving Rev. 27, 3:145 (Fall), 1957.

It Could Be—But Isn't—A very general impression persists that preventive measures have made rheumatic fever a disease of minor importance. This simply is not true. But if current prophylactic programs were really put into wide effect, an 85 per cent reduction in recurrences could be achieved. Local health departments, heart association chapters, and practicing physicians will have to join forces to make preventive measures effective.

ZUKEL, W. J. Prevention of Secondary Attacks of Rheumatic Fever. Pub. Health Rep. 72, 10:895 (Oct.), 1957.

If additional information is desired regarding the articles listed in this bibliography, please communicate directly with the publications in which they appeared; the addresses are furnished for your convenience.

Am. J. Nursing (American Journal of Nursing), 2 Park Ave., New York 16, N. Y.
Canad. J. Pub. Health (Canadian Journal of Public Health), 150 College St., Toronto 5, Canada.
Health Ed. J. (Health Education Journal), Tavistock House, Tavistock Sq., London, W.C. 1, England.
J.A.M.A. (Journal of the American Medical Association), 535 N. Dearborn St., Chicago, Ill.
J. Am. Water Works A. (Journal of the American Water Works Association), 2 Park Ave., New York 16, N. Y.
M. Officer (Medical Officer), Chronicle House, 72–78 Fleet St., London, E.C. 4, England.
New England J. Med. (New England Journal of Medicine), Massachusetts Medical Society, 8 The Fenway, Boston 15, Mass.
Pub. Health (Public Health), Society of Medical Officers of Health, Tavistock House, Tavistock Sq., London, W.C. 1, England.
Pub. Health Rep. (Public Health Reports), Gov. Ptg. Office, Washington, D. C.
Sanitarian (National Association of Sanitarians), 1256 West 7th St., Los Angeles 14, Calif.
Sight-Saving Rev. (Sight-Saving Review), National Society for the Prevention of Blindness, 1790 Broadway, New York 19, N. Y.
Statist. Bull. Metrop. Life Insur. Co. (Statistical Bulletin Metropolitan Life Insurance Company), One Madison Avenue, New York 10, N. Y.

A New Kind of Health Course

Halbert L. Dunn, M.D., chief, Office of Vital Statistics, Public Health Service, will give a course on "The Health Process: High-Level Wellness for Man and Society," at the New School for Social Research in New York City. He will deal with health as "not a state but a process" and the healthy person as more than just unsick, but a person able to deal with both his physical and his social environment. Dr. Dunn will analyze the components of the health process; diagnose and identify various "levels of wellness" beginning with the mere absence of disease and will explore the possibilities of both statistical and qualitative research in the medical as well as social sciences as a means of illuminating the nature and feeling of positive health.

The course is to be given on Mondays, 6:20–8:00 P.M. at 66 West 12th St., New York.

NEWS FROM THE FIELD

WHO News

Revolution Potential of Training

The Technical Assistance Program is "vindicated alone by the achievement of some returned fellow whose imagination has been fired by his experience abroad and who is making his own small revolution in some segment of his country's economy." In these words, David Owen, head of UN's Technical Assistance Program, dramatized the importance of the program's training program. Through this "process-in-reverse," in seven years 14,000 men and women from less well developed countries have been helped to study and train abroad.

Among those in health areas who trained as WHO fellows and are now in key positions are the dean of the Afghanistan Faculty of Medicine, who trained in Austria; the chief of Tuberculosis Laboratories in Egypt; and the director of the Paraguayan National Malaria Service. Among former FAO fellows are the head of the Vaccine Production Department of the Afghanistan Ministry of Agriculture; the chief of Iran's Hydrographic Service; and the chief of the Technology Branch, Haitian Department of Fisheries.

Atomic Engery and Mental Health

Mental health problems associated with the advent of atomic power were discussed by a study group of WHO, meeting in Geneva recently. Psychiatry, atomic and radiation medicine, public health, social anthropology, and journalism were represented.

This Study Group on the Mental Health Aspects of the Peaceful Uses of Atomic Energy had reports from many countries about the emotional impact of atomic energy developments reflected in everyday life, public statements, the press, and in letters from atomic, health, and political leaders. In general, it was found that irrational fears were expressed far more often than irrational hopes.

Reports indicated that a terrifiying aspect of atomic energy in popular imagination is that its tremendous power might get out of control. A biological chain reaction whereby fallout and atomic wastes in succession poison air, water and soil, plants and cattle, and finally man and most importantly his children and descendants was found to be an even deeper and more subtle fear.

Mistrust of sources of information about atomic energy was found to be widespread. There were also found to be presently unrealizable hopes particularly in poor countries whose people are pressing urgently for the higher standard of living they believe is now possible.

The group urged health and other authorities to make use of the concrete contribution the behavioral sciences can make to man's understanding of and adaptation to atomic power.

The most important task outlined was the bringing up of children to put up with insecurity and to face reality free from anxiety and hate, with self-reliance and a sense of responsibility toward others. For this purpose doctors, teachers, clergy and other authorities must be educated in mental health requirements.

Among the suggestions made were the organization locally of a community education plan in matters relating to atomic energy. Small teams of a psychiatrist, a psychologist, a sociologist, and a journalist would study conditions, contribute to the planning of new atomic enterprises and their acceptance by the people.

The general standard of integrity with which the press handled atomic energy

news was recognized but its presentation under scare headlines contributes to the reader's anxiety. Atomic authorities were therefore urged to provide effective information to journalists in order that they might better understand the implications of atomic energy news.

Austen M. Brues, M.D., director of the Division of Biological and Medical Research of the Argonne National Laboratory, was one of two United States representatives at this meeting which included also Brock Chisholm, M.D., of Canada, former WHO director-general. A rapporteur was Professor A. H. Leighton of the Center for Advanced Study in the Behavioral Sciences, Stanford, Calif. Three members were from England, one each from Austria, Denmark, and France.

Smallpox Vaccination Still Needed

International travelers in 1956 were responsible for outbreaks of smallpox in 18 countries. In eight countries the outbreaks reached epidemic proportions. As a result WHO's Committee on International Quarantine, warning against any relaxation of vaccination, called for using potent vaccines and correct vaccination procedures. The committee, meeting in Geneva recently, also drew attention to the advantages of dried smallpox vaccine for mass immunization campaigns.

The eight countries suffering epidemics were Ceylon, Ghana, Great Britain, Iran, Italy, Lebanon, Sierra Leone, and Sudan.

The chairman of the committee was Dr. C. B. Spencer, former chief of the Public Health Service's Division of Foreign Quarantine.

Pennsylvania Jumps Another Hurdle

The Attorney General of Pennsylvania in a recent official opinion declared unconstitutional an act passed by the 1957 Legislature. This act would have denied state aid to any county health department organized later than July 19, 1957. The state aid act became effective in August, 1951.

In commenting on the decision, Governor Leader said, "The Act bears no reasonable relation to a possible goal of stimulating counties to create health departments since it cuts off an incentive to do so without warning."

The Physician and Public Health of the State Medical Society comments, "This opinion should encourage citizens in those counties desiring and contemplating a county health department to continue to plan and to prepare for a referendum in the not too distant future. Sufficient funds are now available for grants to new county health departments that may be established during the current biennium."

ASHA William Freeman Snow Awards

William Freeman Snow Awards of the American Social Hygiene Association "for distinguished service to humanity" were presented to three persons at the association's annual meeting in New York City on November 18. The recipients were Drs. Frances L. Ilg and Arnold Gesell "for their notable contributions to knowledge in the field of infant and child behavior," and posthumously to John Friend Mahoney, former director of the Bureau of Laboratories, New York City Health Department. Dr. Mahoney was responsible for the development of penicillin as a rapid cure for syphilis, gonorrhea, and other venereal diseases.

The principal speaker at the presentation luncheon was Francis J. Brown, Ph.D., staff associate, American Council on Education. At this luncheon, also, Honorary Life Membership was conferred on Robert S. Bird, staff reporter of the New York Herald Tribune, primarily for a series of six articles on

venereal disease conditions in the United States.

Examinations for Dental Diplomates

The American Board of Dental Public Health will hold its next certifying examination on November 6 and 7, 1958, in Dallas, Tex., in conjunction with the annual meeting of the American Dental Association. Applications for this examination must be submitted not later than July 1, 1958, to the secretary of the Board, Dr. Chester V. Tossy, Michigan Department of Health, Lansing.

Officers elected at the recent meeting in Coral Gables are:

President—John W. Knutson, D.D.S., Assistant Surgeon General, Public Health Service
Vice-President-Auditor—Philip E. Blackerby, Jr., D.D.S., Associate General Director, W. K. Kellogg Foundation
Secretary-Treasurer—Chester V. Tossy, D.D.S., M.P.H., Michigan State Department of Health

Bacterial Food Poisoning

"Bacterial Food Poisoning and Its Control—A Review," by William B. Esselen and Arthur S. Levine of the University of Massachusetts staff, outlines present knowledge of the relationship of foods to bacterial food poisoning, with special reference to the staphylococci, Salmonellae, and streptococci. More than 300 references are included in the bibliography. Copies available from Mailing Room, Munson Hall Annex, University of Massachusetts, Amherst. Free.

National Cancer Institute Research

The Public Health Service has created a six-man board to review and make recommendations about research activities conducted by the National Cancer Institute. This board is concerned only with the scientific activities of the Institute itself, whereas the National Advisory Council continues to make recommendations on PHS grants for cancer research grants to nonfederal institutions.

Chairman of the new board is Nobel prize winner, Wendell M. Stanley, Sc.D., director of the Virus Laboratory, University of California at Berkeley.

International Ophthalmology Meet

Because "an international Congress offers enormous value in the training and exchange of ideas" among scientific investigators, the National Institute of Neurological Diseases and Blindness has established a special travel fund to enable younger ophthalmologists and related scientists to attend the 18th International Ophthalmology Congress. This will be held in Brussels, September 8–12, 1958. Deadline date for applications for this aid is March 1, 1958. These, including a brief review of the applicant's educational and occupational background and his major field of interest, should be sent to Dr. Gordon Seger, Chief, Extramural Programs, National Institute of Neurological Diseases and Blindness, Bethesda, Md.

Another Town Votes Fluoridation

With more than 20,000 persons voting in a referendum, the township of Tonawanda, N. Y., accepted fluoridation of water supplies by a majority of more than two to one. This was a particularly significant victory since defeat might have endangered the fluoridation of Buffalo's water supply serving more than a half million persons since 1955. Buffalo and Tonawanda share some of the same water supplies.

Two New Missouri Counties Voted

As a result of a campaign inspired by the respective county health councils, two Missouri counties in September

voted mill taxes for county health units. In each county the starting point was inadequate county nursing services and in each county the remedy was to vote the establishment of a health department that would provide other personnel as well as nurses.

In Ralls County, where the vote was 13 to 1, the campaign began in June; in Webster County 24 days of work convinced the citizens.

Unifying Rehabilitation Services

Because of the Milwaukee community's interest in the handicapped who have multiple problems needing a variety of skilled services, Marquette University has begun a project to coordinate these services. At the same time the teaching of rehabilitation to medical students is to be coordinated.

The director of the project is Alice H. Sanders, former secretary of the Health Division, Milwaukee Community Welfare Council, which planned the project. An executive committee is chaired by the dean of the medical school and includes representatives from other organizations with a stake in rehabilitation.

The project has been made possible by a federal grant to the university. The teaching project is supported by the National Foundation for Infantile Paralysis.

Quality of Commercial Structures

"Measuring Deterioration in Commercial and Industrial Areas" describes a demonstration project of the City Plan Commission, St. Louis, Mo., to develop a set of standards and measurements and technic and method by which to evaluate obsolescence and deterioration in commercial and industrial buildings and areas. The schedule and a technic to be used with commercial and industrial buildings and areas were based on the American Public Health Association's "Appraisal Method for Measuring the Quality of Housing." The process of selecting the survey forms is outlined in order to assist others who might attempt a solution of the same problem in a different way. Copies of report from the City Plan Commission, Civil Courts Building, St. Louis, Mo., or Demonstration Program Branch, Urban Renewal Administration, Housing and Home Finance Agency, Washington 25, D. C. A demonstration grant by the latter organization made the project and the publication of the report possible.

Eye Diseases Research Grants

The National Council to Combat Blindness is receiving applications for 1958–1959 "Fight for Sight" grants-in-aid, research fellowships (predoctoral and postdoctoral and traveling), and summer student fellowships. Deadline date for receipt of applications is March 1, 1958. The Council's Scientific Advisory Committee of 19 members, headed by Charles A. Perera, M.D., associate professor of ophthalmology, Columbia University College of Physicians and Surgeons, will act on the applications in June, 1958.

For 1957–1958 research allocations totaling $128,000 included 24 each of grants-in-aid and summer student fellowships, and 10 research fellowships.

Application forms from Secretary, National Council to Combat Blindness, 41 West 57th St., New York 19, N. Y.

Medical Guidance of Copy Writers

"An independent, nonprofit organization of physicians offering consultation and commendation to all who use the media of mass communication to benefit the health and welfare of children" is the description given on an information brochure of the Physicians' Council for Information on Child Health. This organization, originally named the Na-

tional Council on Infant and Child Care, is now more than a year old. It is made up of both practicing and teaching physicians, "selected for their breadth of medical knowledge and their sensitivity to the needs of the public and to the contributions of industry."

In a brochure recently published the Council sets up separate codes for advertising and for medical writing. Plans are outlined for prepublication review of such material by the Council followed by an insignia and statement of approval by the Council if its standards are met.

Charles D. May, M.D., former chairman of the Department of Pediatrics, State University of Iowa Medical School and editor of Pediatrics, is the executive director, and Margaret S. Lyman, M.D., former resident in the University Hospitals, is assistant director. Offices are at 2 East 63rd St., New York 21.

PERSONALS

HAROLD J. BARNUM, chief of Milk Sanitation Services, Department of Health and Hospitals, Denver, has received the 1957 Sanitarian's Award of $1,000 presented annually by the International Association of Milk and Food Sanitarians to the county or municipal public health sanitarian who has contributed most meritoriously to the health and welfare of his community for the preceding five years.

ANNA BOLLER BEACH,* director, Nutrition Clinic, Presbyterian-St. Luke's Hospital, Chicago, has been named the 1957 recipient of the Marjorie Hulsizer Copher Award, in recognition of distinguished service to the dietetic profession.

CLYDE A. BRIDGER,* former dierctor, Bureau of Vital Statistics, Missouri Division of Health, has been appointed chief, Bureau of Statistics, Illinois State Department of Public Health, succeeding O. K. Sagen, Ph.D.,* resigned to join the staff of the new National Health Survey of the Public Health Service.

VELMA BRIGHAM, formerly a food supervisor and manager, Tulane University, is a nutrition consultant with the Nutrition Unit and the Division of Cancer and Other Chronic Diseases, Connecticut State Health Department.

ALFRED D. BUCHMUELLER,† former director, Mental Health Service Division, St. Louis (Mo.) County Health Department, is now executive director, Child Study Association of America.

EDWIN L. CROSBY, M.D.,* director, American Hospital Association, delivered the 1957 Charles F. Wilinsky Lecture of the Harvard University School of Public Health, October 14, on the topic "The Hospital, Health Center of the Community."

GILBERT J. DALLDORF, M.D., former director, Division of Laboratories and Research, New York State Department of Health, has been appointed associate medical director, National Foundation for Infantile Paralysis.

ADAH DAVIS,† former field supervisor, Division of Public Health Nursing, Philadelphia Health Department, has been appointed assistant director of public health nursing, Westchester County Department of Health, White Plains, N. Y.

KAY EDGAR, M.D., former assistant chief, has been named chief, Bureau of Maternal and Child Health, Department of Health, Territory of Hawaii.

MILDRED ELSON, former executive director, American Physical Therapy Association, has been appointed special assistant to the secretary general, International Society for the Welfare of Cripples, New York City.

GUNHILD GISLERUD, M.D., M.P.H., former school physician, Milwaukee Department of Health, has been appointed public health physician in charge of the Cancer Control Section, Division of Chronic Diseases, Pennsylvania State Health Department.

SAMUEL A. GRAHAM, JR., M.D., M.P.H.,* former health officer, Martin County, N. C., is now director of public health, Portsmouth, Va.

TRESA GRUETER, R.N., former assistant professor of nursing, Seton Unit, Loretta Heights College, Colorado Springs, has been appointed public health nursing consultant, Montana State Health Department, Helena.

MARGUERITE F. HALL, Ph.D.,* former director, Division of Vital Statistics and Administration, New Jersey Health Department, has been appointed director of a new research unit within the department.

VERNE K. HARVEY, M.D.,† former medical director, Civil Service Commission, is now professional services director, Indianapolis Veterans Administration Hospitals.

ARTHUR T. HEUBNER, senior industrial hygiene engineer, Bureau of Industrial Hygiene, Connecticut State Health Department, has

* Fellow.
† Member.

been appointed the bureau's radiation health physicist.

T. P. HIPKENS,† former rehabilitation administrator, Pittsburgh Office, United Mine Workers of America Welfare and Retirement Fund, has been named executive director of the Industrial Home for Crippled Children, Pittsburgh.

WILLIAM D. IRVING, M.D., is staff director in the Connecticut Health Department of "A Community Program for Mentally Retarded Children," a special project sponsored by the Department and Yale University School of Medicine in cooperation with the Association for Retarded Children in Greater New Haven and the Grace-New Haven Community Hospital.

F. P. JACCI, JR., D.V.M.,† professor of veterinary microbiology and assistant to the dean, School of Veterinary Medicine, A. and M. College of Texas, has been appointed head of the Department of Veterinary Public Health.

BARBARA KAHN, M.P.H.,† former health education consultant, Occupational Health Section, Oregon State Board of Health, has been appointed public health education consultant, Division of Medical Services, New York State Department of Health.

WILLIAM N. KENNEY, former executive secretary, Cattaraugus County Tuberculosis and Health Association, has been appointed executive secretary, Staten Island Committee, New York Tuberculosis and Health Association, succeeding SARAH SPROLES, now on the staff of the Florida Tuberculosis and Health Association.

ROBERT C. KRUTZ,† has been appointed assistant administrator, Citizens General Hospital, New Kensington, Pa.

DONALD G. LEDERMAN has been assigned by the Public Health Service to the Pennsylvania Department of Health as program director, Venereal Disease Section.

JAMES LISTON, former special features editor of Better Homes and Gardens, has been named editor of Today's Health, the American Medical Association's lay health magazine, succeeding W. W. BAUER, M.D.,* who is also director, AMA Bureau of Health Education.

CHARLES E. LYGHT, M.D., F.A.C.P.,* director, Medical Publications, Merck, Sharp and Dohme Research Laboratories, Rahway, N. J., is 1958 president, American Medical Writers' Association.

CHARLES D. MARPLE, M.D.,† former medical director, American Heart Association, has been appointed medical director, American Foundation for Allergic Diseases, New York City.

J. D. MARTIN, M.D.,* former chief, Section of Epidemiology, Louisiana State Department of Health, is now director, Bureau of Medical Services of the state's Department of Public Welfare, Baton Rouge.

RICHARD LAMBERT MASLAND, M.D., former professor of neurology and psychiatry, Bowman Gray School of Medicine, has been appointed assistant director, National Institute of Neurological Diseases and Blindness.

PROFESSOR MILTON M. MILLER,* chairman, Department of Sanitary Science, University of Denver, has been named the 1957 recipient of the Walter S. Mangold Award given by the National Association of Sanitarians for "outstanding contributions to the professional advancement of the sanitarian."

ALBERT PARKER,* chemical engineering consultant, has taken a five-year assignment as a member of the WHO's Expert Advisory Panel on Environmental Sanitation and the Expert Committee on Air Pollution, which met in Geneva in November.

MILDRED C. J. PFEIFFER, M.D., M.P.H.,* former chief, Division of Chronic Diseases, is now heading the new Division of Planning and Evaluation, Pennsylvania State Health Department.

LOUIS S. REED, Ph.D.,* former health economist, Occupational Health Program, Public Health Service, is now associate professor of medical economics, Sloan Institute of Hospital Administration, Cornell University, Ithaca, N. Y.

JULIUS RIVERA, Ph.D., former research assistant, Michigan State University, has been appointed migrant labor consultant, Maternal and Child Health and Crippled Children Section, Colorado State Health Department.

HERBERT RUBINSTEIN, formerly health education consultant, Pennsylvania Tuberculosis and Health Society, is now executive director, Pennsylvania Health Council, Harrisburg.

ALICE SCOTT, former assistant to the chief and nursing education director, has been appointed chief, Bureau of Public Health Nursing, Hawaii Health Department, succeeding ALISON MACBRIDE,† resigned to head the nurses' licensing board.

NATHAN SMITH, R.S.,† former inspector, New York City Health Department, has been appointed warehouse sanitation consultant, Francis H. Leggett Corporation, grocers.

GERALD J. SPECTER, former director of health education, Charleston County (S. C.) Health Department, has been appointed director

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* Fellow.
† Member.

of health education, Philadelphia Tuberculosis and Health Association.

EDWARD L. SYPNIESKI is now executive director, North Dakota Tuberculosis and Health Association, succeeding JAMES A. SWOMLEY,† resigned to become executive director, Connecticut Tuberculosis Association.

LOUIS SZWEJDA, D.D.S., M.P.H., has been appointed principal public health dentist, Bureau of Dental Health, New York State Department of Health, to fill the position temporarily while HARRY L. DRAKER, D.D.S.,† is on leave to work for the M.P.H. degree at the University of Michigan School of Public Health.

FRANCES E. TAYLOR, R.N.,* former placement officer for commissioned officers, Bureau of State Services, Division of Personnel, is now assistant chief of public health nursing, Public Health Service.

ANN M. THOMSON, R.N., M.P.H.,† acting chief of the Nursing Section, Massachusetts State Health Department, has been appointed chief of the section.

ELSIE TOAVS, R.N., former staff nurse, Cascade County Health Department has been appointed public health nurse, Heart Diagnostic Center, Montana State Health Department, Great Falls.

JANICE WESTABY, R.N.,† former director, Home Safety Program, Oregon State Board of Health, is now public health education consultant, Division of Medical Services, New York State Department of Health.

CHARLES L. WILBAR, JR., M.D.,* former deputy secretary, has been appointed secretary of health, Commonwealth of Pennsylvania, succeeding BERWYN F. MATTISON, M.D.,* resigned to become executive secretary, American Public Health Association. Dr. Wilbar is the third professionally trained public health physician to be appointed to the position since the modernized public health law of the state went into effect in 1951.

WILLIAM J. ZUKEL, M.D.,* of the Public Health Service staff, has been made assistant director, National Heart Institute.

DEATHS

LINN H. ENSLOW,* editor of Water and Sewage Works magazine, on November 3, 1957 (Engineering and Sanitation Section).

EARL G. LUDLAM, D.D.S., M.P.H.,† chief, Dental Division, New Jersey State Department of Health, Trenton, on October 12 (Dental Health Section).

SAMUEL N. MALLISON, M.D.,* health officer of the East Central Region of the Illinois State Department of Public Health on October 5 (Health Officers Section).

CARL PUCKETT, M.D.,† managing director of the Oklahoma Tuberculosis Association since 1927 until his death September 27 (Health Officers Section).

GEORGE L. RAMSEY,† assistant to the sales director, Wyeth Laboratories, Philadelphia, Pa., on November 13 (Laboratory Section).

CHARLES C. TREMBLEY, M.D.,* of Ormond Beach, Fla. (Unaffiliated)

CONFERENCES AND DATES

State and Regional Public Health Meetings:

Texas Public Health Association. Hotel Baker, Dallas. February 23–26.

Meetings of Other Organizations Coming in January, February, and March:

American Academy of Occupational Medicine. Savoy Plaza Hotel, New York, N. Y. February 12–14.

American Orthopsychiatric Association. Hotels Commodore and Roosevelt, New York, N. Y. March 6–8.

Child Study Association of America. Annual Conference. Hotel Roosevelt. New York, N. Y. March 24.

Annual Institute for Workers in Parentage Education. Teachers College, New York, N. Y. March 25–26.

Council of Social Work Education. Statler Hotel, Detroit, Mich. January 29–February 1.

International Atomic Exposition, Inc. Chicago Amphitheatre, Chicago, Ill. March 17–21.

National Advisory Committee on Local Health Departments in conjunction with the National Health Forum. Philadelphia, Pa. March 18.

National Council on Alcoholism. New York, N. Y. March 26–28.

National Health Forum. Sheraton Hotel, Philadelphia, Pa. March 18–20.

National Society for the Prevention of Blindness. Philadelphia, Pa. March 12–14.

United Community Funds and Councils of America (Biennial). Cleveland, Ohio. February 24–28.

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* Fellow.
† Member.

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This authoritative volume, first published in 1948, has been completely revised under the joint editorship of Thomas Francis, Jr., M.D., and Joseph E. Smadel, M.D. Each chapter has been completely rewritten. There is a new chapter on general principles, directed primarily to those laboratory people unfamiliar with virology and rickettsiology. In this chapter will be found a discussion of general considerations bearing directly on applied technics and a correlation of methods and technics. New Chapters are also presented on tissue culture methods and on the Coxsackie viruses. The volume is illustrated with 36 figures and contains 45 tables. Total pages 50 per cent greater than in First Edition.

Chapters and authors of the Second Edition are:

General Principles Underlying Laboratory Diagnosis of Viral and Rickettsial Infections. Edwin H. Lennette, M.D., Ph.D.

Poliomyelitis. John R. Paul, M.D., and Joseph L. Melnick, Ph.D.

Tissue Culture Methods for the Cultivation of Poliomyelitis and Other Viruses. Joseph L. Melnick, Ph.D.

The Coxsackie Viruses. Gilbert Dalldorf, M.D., and Grace M. Sickles.

Encephalitis (Arthropod-Borne Virus Encephalitides and Lymphocytic Choriomeningitis). W. McD. Hammon, M.D.

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Lymphogranuloma Venereum. Geoffrey Rake, M.B.

Miscellaneous Virus Diseases. Maurice R. Hilleman, Ph.D.

Rickettsial Diseases. Joseph E. Smadel, M.D.

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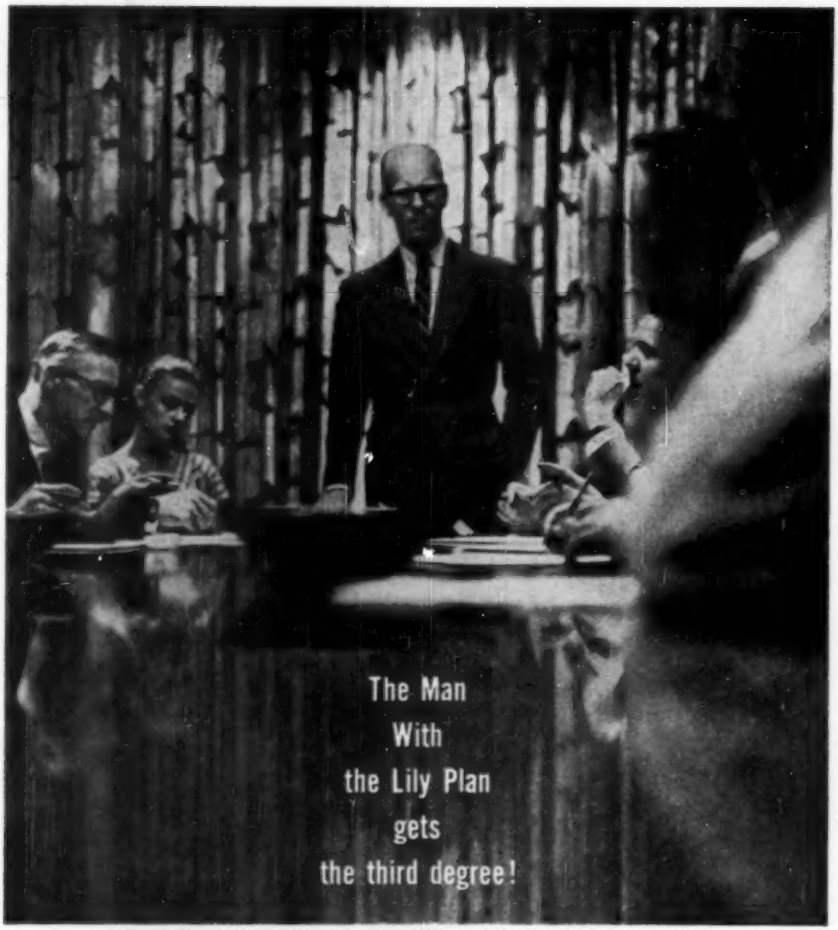

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